THE INDIAN CADDIS-FLIES (*TRICHOPTERA*).

BY

MARTIN E. MOSELY, F.R.E.S.

(*With* 16 *text-figures and* 18 *plates*).

PART IV.

(*Continued from page* 133 *of volume* xxxviii).

LIMNOPHILIDAE.

Kolenati.—Gen. et Spec. Trich., vol. ii, p. 29, 1859.

CHARACTERS OF THE FAMILY.

Antennae as long as (rarely longer than or slightly shorter than) the wings, moderately stout, the basal joint bulbose. Ocelli always present. Maxillary palpi three-jointed in the male, five-jointed in the female, similar in structure in both sexes, only slightly pubescent, the basal joint short. Labial palpi small, the end joint often concave. Legs usually rather long; tibial spurs varying greatly, but the anterior tibiae are either spurless or have only one (apical) spur (excepting in *Astratus* where there is an unusually formed double black spur) and the intermediate have never more than three; tibiae and tarsi usually with strong spines. Abdomen generally short and robust; the margin of the eighth segment often produced. The appendages of the male tolerably constant in general character; that is to say, there is a pair of (ordinarily) small superior appendages, a pair of (ordinarily) lanceolate intermediate appendages, and a pair of inferior appendages, often fused to the ninth segment. Between these appendages is placed the penis which is usually short and cylindrical and generally accompanied by a pair of sheaths which are often bifid or pectinate.

In the female the ninth segment is nearly always visible both dorsally and ventrally; above, it is generally accompanied by a pair of pubescent appendages, and below them there is ordinarily a testaceous tubular piece open in front. On the surface of the eighth ventral segment is the vulvar scale which is generally trifid, consisting of two side lobes and a more or less tongue-shaped median lobe.

Wings usually ample and only slightly pubescent; but sometimes there is a close dense pubescence and the membrane may be granulose and with long erect hairs which are more frequently confined to the veins. Normally the neuration is similar in both sexes. In the anterior wing, the discoidal cell is always closed (excepting in one or two aberrant forms); the sub-costa ends usually in the costa but in one sub-family it ends abruptly in a

transverse nervule between the costa and radius; there is no median cellule and the cellula thyridii is always long and narrow; four basal cellules; the anastomosis is usually divided into two portions, the lower placed nearer the base of the wing than the upper but in some genera both portions are nearly in line; there are nine apical cellules, and forks Nos. 1, 2, 3 and 5 are present. The posterior wings are shorter and much broader, and broadly folded; the anal portion usually well developed: discoidal cell usually closed (but open in one group); eight apical cellules and forks Nos. 1, 2, 3 and 5 present.

There are three very anomalous genera which, however, have not as yet been recorded in the Indian fauna, *Anomalopteryx*, *Thamastes* and *Enoicyla;* of these the first two depart widely in their neuration from the general form, with rudimentary posterior wings, and, in *Enoicyla*, the female insect is to all intents and purposes, apterous.

There are several female examples in the British Museum and the author's collections belonging to the *Limnophilinae*. I refrain from naming these as it is very probable that some at least may be associated with males either already described or perhaps described here as new.

Sub-families.

Limnophilinae Ulmer.

Apataniinae Ulmer.

Characters of the Sub-families.

1. In the anterior wing, the sub-costa continues to the costal margin. Limnophilinae Ulm. (Text-fig. 1).

2. In the anterior wing, the sub-costa ends in a cross-vein joining the radius and costal margin. Apataniinae Ulm. (Text-fig. 14).

Limnophilinae Ulmer.

Limnophilinae Ulmer.—Ab. Natur. Ver. Hamb., xviii, pp. 42, 46, 1903.

The sub-family of the *Limnophilinae* contains most of the Indian *Limnophilid* genera, and might well be further subdivided in a work having a world-wide range. There are objections, however, to the creation of sub-families to deal with the fauna of a particular region, so I shall therefore restrict myself to the collecting together of certain genera into two groups in the hope that this course may render easier the study of the Indian *Limnophilinae*.

First will come the group of *Colpotaulius*, characterised by the formation of the anterior legs of the male, which differ from those of the female in having a deep groove along the femora lined with short black setae, and in the genera *Colpotaulius* and *Astratus*, having peculiarly shaped black spurs. In *Astratodina* the groove is present, but there are no spurs.

The remaining genera will not fit comfortably into a single group although most of them follow closely the pattern of Martynov's *Pseudostenophylax*.

I omit the European genus *Stenophylax* from my tables. Navás has described an Indian species in this genus. I am unable to recognise it from the description, and I think it doubtful in the extreme that the genus is really *Stenophylax* as we know it in Europe.

Table of the Indian Limnophilinae genera.

1. Insects in the male with a groove lined with black setae on the anterior femora, generally with a specialised black spur on this leg; female leg normal. (*Colpotaulius* group) 2
—Anterior leg of the male without the groove or specialised spur. 4

2. No specialised spur on the anterior leg. Astratodina gen. nov. p. 450
—One or more specialised spurs on the anterior leg. 3

3. A single specialised black spur. Colpotaulius Kol. p. 451
—Paired black spurs. Astratus McLach. p. 452

4. In the male, first joint of the anterior tarsus much shorter than the second; discoidal cell in both sexes strongly excised along its upper margin. Micropterna Stein p. 454
—In the male, first joint of the anterior tarsus not shorter than the second. 5

5. In the male, posterior wing with specialised scales or specialised hairs. 6
—Male posterior wing without such scales or hairs. 7

6. Scales or hairs in the anal region of the posterior wing either entirely or partly along A_2. Pseudostenophylax Mart. p. 455
—Scales or hairs along the region of the sector. Astenophylodes gen. nov. p. 458

7. Posterior wing of the male with a strong triangular anal projection. Stenophylina Mosely p. 460
—Posterior wing of the male normal. 8

8. All the tergites covered with long silky hairs. Trichophylax gen. nov. p. 461
—Tergites normal. 9

9. Anterior wing of the male with a mass of black setae occupying the basal half of the costal area. Pseudohalesus Mart. p. 462
—Anterior wing of the male without such setae. 10

10. Distal margin of the anterior wing undulating, neuration of the male posterior wing abnormal with only fork No. 5 present. Halesinus Ulm. p. 465
—Margin of the anterior wing not undulating; posterior wing of the male normal. 11

11. Spurs 1, 2, 2. 12
—Spurs 1, 3, 4. 13

12. Fork No. 3 of the posterior wing passes the cross-vein at its apex. PLATYPHYLAX McLach. p. 467
—Fork No. 3 of the posterior wing meets the cross-vein at its apex. PHYLOSTENAX Mosely p. 468

13. Superior appendages very long, blade like (see Text-fig. 11). ANABOLIA Steph. p. 470
—Superior appendages not so long. 14

14. Discoidal cells of both wings much longer than their footstalks. STENOPHYLIELLA gen. nov. p. 471
—Discoidal cells of both wings shorter or as long as their footstalks. ASTENOPHYLINA gen. nov. p. 473

Astratodina gen. n.

Closely allied to *Colpotaulius* and *Astratus* but the ♂ without the specialised spurs on the anterior legs.

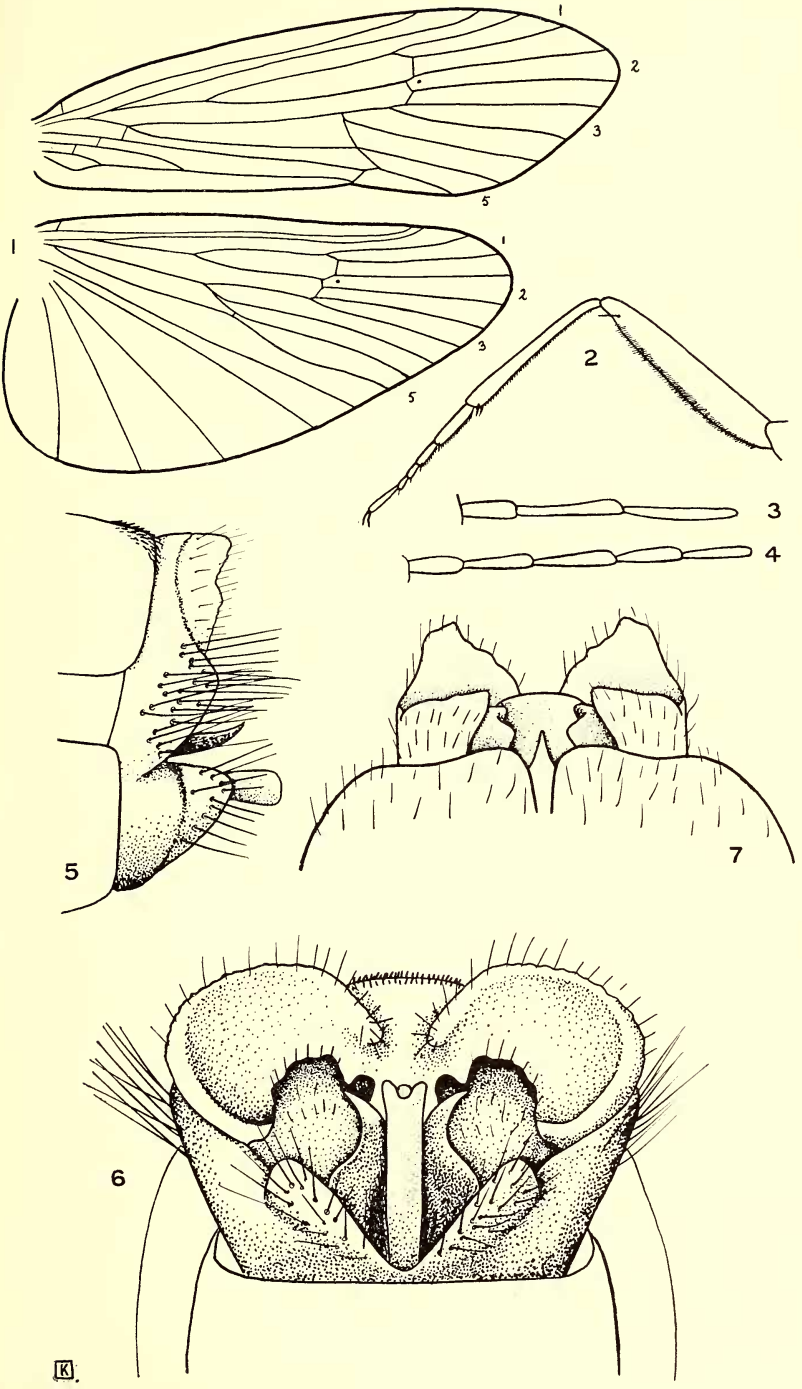
Antennae slender, about the length of the anterior wings, basal joint large and rounded, particularly on the inner side, next joint short; maxillary palpi ♂, first joint short; second long, about four times the length of the first; third slightly shorter than the second; ♀, basal joint short, about half the length of the second; third slightly longer than the second; fourth slightly longer than the first; fifth about as long as the second. Anterior wings elongate, costa somewhat rounded, apex sub-acute discoidal cell long (in both anterior and posterior), membrane granulose; legs differing in the sexes; ♂ with the anterior formed as in *Astratus* but without spurs, femora with a groove lined with black setae which are present also on the tibiae; first tarsal joint more than twice the length of the second; spines black, no spines on the terminal tarsal joints; spurs 0, 2, 2 ♂; 1, 2, 2 ♀.

—Genotype: *Astratodina inermis* sp. n.

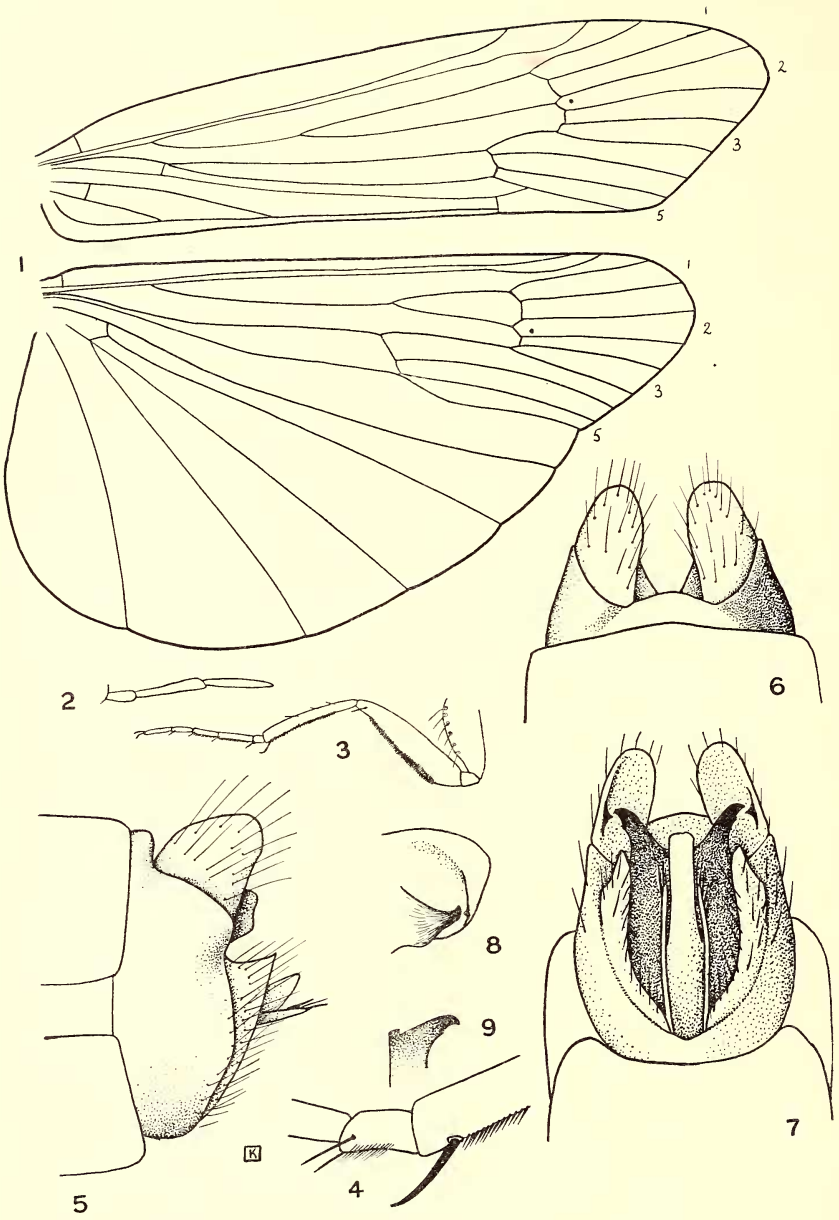
Astratodina inermis sp. n. (Pl. I, figs. 1-7).

Head dark fulvous, antennae lighter in colour than the head with still paler annulations; palpi and legs, pale fulvous; the anterior femur carries a single black spine (not a spur) on its outer surface towards the apex. Anterior wing elongate, cinereous with yellowish irrorations, membrane granulose with short yellowish hairs, fringes yellowish; neuration inclined to aberrancy, in one example the second and third apical sectors are bent inwards towards each other and united on one side by a cross vein, in others, neuration is normal.

Genitalia ♂.—Margin of the eighth dorsal segment rounded and set with short black setae; superior appendages are welded to the ninth segment making a pair of large rounded processes as seen from above; the ninth segment towards the centre of its lateral margin is heavily fringed with long stout bristles; from behind may be seen a pair of broad, strongly chitinised intermediate appendages, apices truncate, slightly serrate and deeply



Astratodina inermis sp.n., Fig. 1, wings ♂. Fig. 2, anterior leg ♂. Fig. 3, maxillary palpus ♂. Fig. 4, maxillary palpus ♀. Fig. 5, genitalia ♂, lateral. Fig. 6, ventral and slightly from behind. Fig. 7, genitalia ♀, ventral.



Colpotaulius major Mart., ♂. Fig. 1, wings. Fig. 2, maxillary palpus. Fig. 3, anterior leg. Fig. 4, specialised spur enlarged. Fig. 5, genitalia, lateral. Fig. 6, dorsal. Fig. 7, from behind. Fig. 8, superior appendage with apex of intermediate appendage, from within. Fig. 9, apex of intermediate appendage from behind.

notched towards their inner margins; penis-sheaths very strong and heavily chitinised, bases broad, apices acute, curving outward on each side of the penis which is short and straight; inferior appendages small and rounded, thickly beset with strong hairs and projecting only slightly beyond the ninth segment to which they appear to be welded.

♀.—The surface of all the dorsal segments set with minute setae, rather longer at the apical margin of the eighth; beyond this segment are two broad triangular processes with the inner margins somewhat serrate and carrying small rounded forks at their bases as seen from above; as seen from beneath, the processes are continued in broad inturned plates of which the inner apical angles appear as pointed projections; vulvar scale with two broad wings and a small and acute inner process; previous segment deeply and narrowly excised in the centre of its apical margin.

Length of anterior wing ♂ 12 mm.

Length of anterior wing ♀ 16 mm.

Western Tibet; Lhabaps, ft. 11,855, 23-vi-1932 G. E. Hutchinson, Yale North India Expedition.

Type ♂ and paratype ♀ in the British Museum collections, other paratypes ♂ and ♀ from the same locality in the collections of the Yale University, United States of America.

Colpotaulius Kol.

Colpotaulius Kolenati.—Gen. et Species Trichop., pt. 1, p. 47, 1848; McLachlan.—Rev. & Syn. Trich., p. 34, 1874; Ulmer.—Gen. Insect., fasc. 60a, p. 36, 1909.

Maxillary palpi ♂, basal joint less than half the length of the second which is slightly longer than the third; spurs 1, 3, 4 ♂ ♀ but that on the anterior tibia of the ♂ is differently formed to the equivalent spur in the ♀ being intensely black, sometimes long and thin with merely the apex slightly curved, sometimes stout and curved resembling a strong spine. First joint of the anterior tarsus in the ♂ only half the length of the second, whereas in the ♀ it is nearly one-third longer than the second. Tibiae with few spines on the anterior but they are more numerous on the two other pairs and on the tarsi; the anterior legs of the ♂ short and stout, the tibia fitting into a groove on the inner side of the femur, this groove being clothed with short and dense black setae. Antennae about the length of the wings, moderately stout. Anterior wings elongate with moderately dense short pubescence and evident apical fringe, costal margin gently rounded, the apex sub-acute; discoidal cell very long and narrow; no marked pterostigma. Posterior wings very deeply incised below the apex at the point where the lower branch of the cubitus terminates.

Genotype: *Colpotaulius incisus* Curt.

Colpotaulius major Mart. (Pl. II, figs. 1-9).

Colpotaulius major Martynov.—Zool. Jahrb. Bd. xxvii, pp. 516-8, pl. 24 figs. 1-4, 1909.

C. incisus Curt. n. var. Martynov.—Ann. Mus. Zool. ac. sci. U.R.S.S., vol. xxvi, p. 24, Pl. II fig. 9, 1925.

Head and thorax clothed with yellowish-grey hairs; antennae brownish testaceous with light-ochraceous annulations. Wings yellowish with brownish markings; under-surface of the anterior femora of the ♂ set with close black hairs, the abnormal single spur of this leg long, black and slightly curved at the tip.

Genitalia ♂.—Margin of the ninth dorsal segment slightly produced and rounded; superior appendages from above, large, obscuring all the rest of the genitalia excepting the inner margins of the intermediate appendages; the lower margin of each appendage is produced at its centre in a short, blackened, triangular, inturned spur; intermediate appendages from the side, broad at the bases terminating in acute blackened apices (hidden by superior appendages); from beneath, the appendages are directed slightly outward and are notched towards the inner angles of their apical margins so that they resemble a pair of boots placed heel to heel with the soles directed upwards and the toes well turned out; penis straight, apex blunt; penis-sheaths long and slender, apices pectinate; inferior appendages welded to the ninth segment; from the side, triangular, only slightly projecting beyond the line of juncture with the segment; from beneath, with only the apical third free and distinct from the segment, apices acute.

Length of anterior wing ♂ 12 mm.

Kashmir, Caucasus, Kamtshatka.

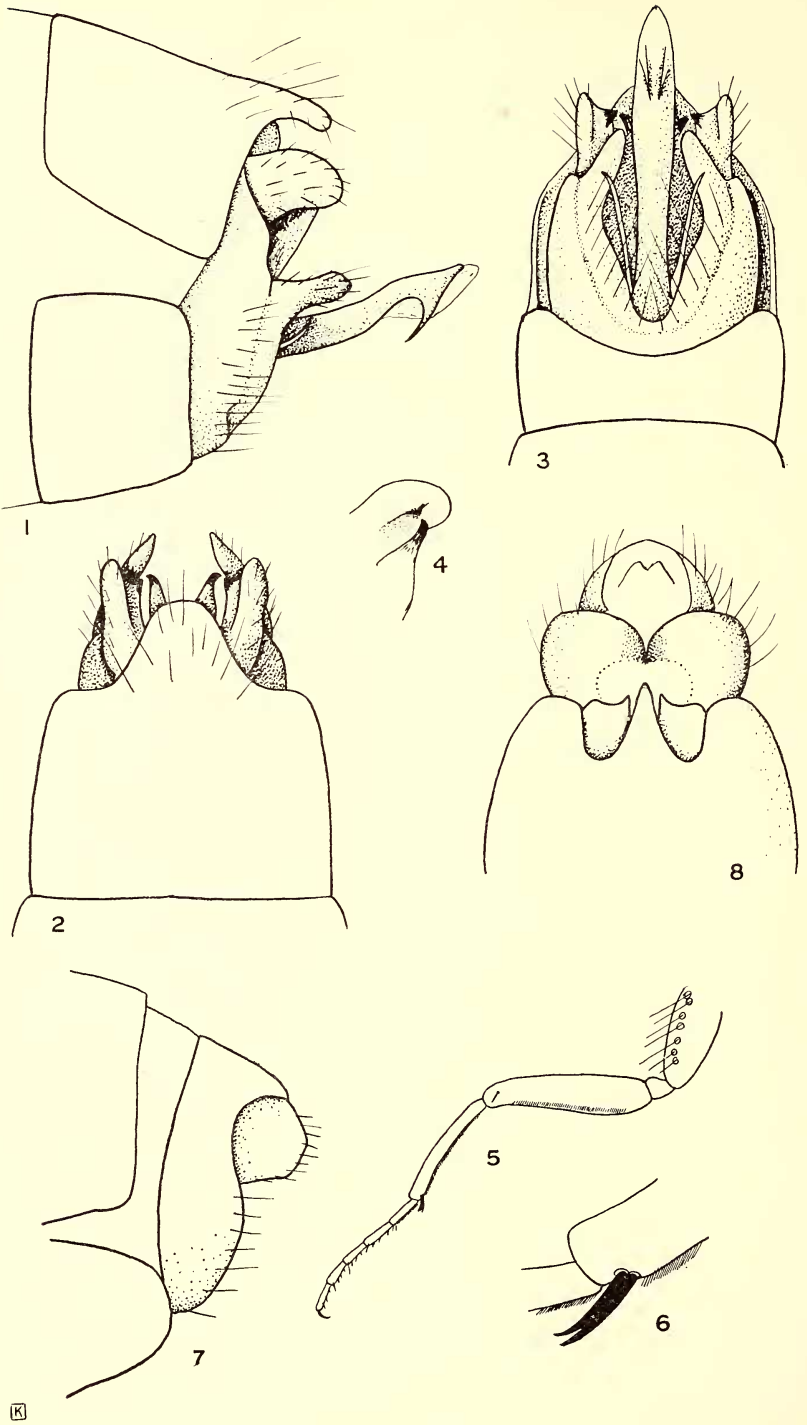
In the Ann. Mus. Zool. Ac. Sci., 1925, Martynov describes from Kamtshatka, a *Colpotaulius* as a variety of *C. incisus* Curt. The genitalia as figured differ far too widely from those of Curtis's species for the Kamtshatka insect to be associated with it even as a variety. On the other hand, the figures of these parts are indistinguishable from those given with the description of *C. major* and I conclude, in spite of the wideness of the range that the so-called variety is in fact this species.

Astratus McL. (Text-figs. 1-3).

Astratus McLachlan.—Rev. and Syn. Trich., p. 36, 1874; Ulmer.—Gen. Insect., fasc. 60a, p. 37, 1907.

Maxillary palpi ♂, first joint about two-thirds the length of the second which is slightly longer than the third.

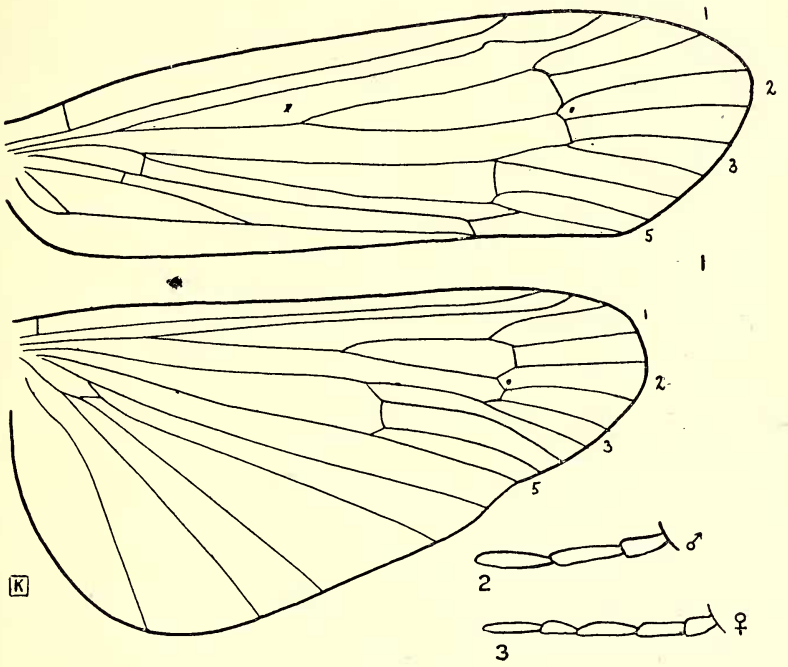
Maxillary palpi ♀, first joint about two-thirds the length of the second which is slightly shorter than the third, fourth as short as the first, fifth as long as the third; anterior wings elongate with moderately short pubescence; discoidal cell long and narrow; posterior wings somewhat excised below the apex; spurs ♂, 2, 3, 4 or 2, 3, 3, ♀ 1, 3, 4 or 1, 3, 3; anterior legs differing in form in the two sexes; in the male, femora broad, lower margins of the femora and tibiae lined with fringes of short black setae; spurs 2 in number, long, black, slightly hooked at the apices and set closely together in juxtaposition so that the presence of a second spur may easily be overlooked; first joint of the tarsus much longer than the second; in the female, the anterior leg normal with a single normally formed spur and no fringes of black setae; in the ♂ margin of the eighth dorsal segment strongly produced at its centre with the extreme apex generally fringed with short



Astratus tricalcaratus sp.n., ♂. Fig. 1, genitalia, lateral. Fig. 2, dorsal. Fig. 3, ventral and from behind. Fig. 4, superior appendage with apex of intermediate appendage, from within. Fig. 5, anterior leg. Fig. 6, specialised spurs of the anterior leg, enlarged. Fig. 7, ♀ genitalia, lateral. Fig. 8, ♀ genitalia, ventral.

black setae; inferior appendages welded to the sides of the ninth segment.

Genotype: *Astratus asiaticus* McL.



Figs. 1-3. *Astratus tricalcaratus* sp.n., Fig. 1, wings ♂. Fig. 2, maxillary palpus ♂. Fig. 3, maxillary palpus ♀.

Astratus tricalcaratus sp. n. (Text.figs. 6-7; Pl. X, figs. 1-3).

Head testaceous, oculi dark testaceous, antennae of the same colour with darker annulations. Wings long, narrow, greyish, nervures dark; spurs ♂ 2, 3, 3, ♀ 1, 3, 3; spurs of the anterior leg ♂ as detailed in the generic description.

Genitalia ♂.—The apical margin of the eighth dorsal segment is strongly produced at the centre but there is no mat of short black setae lining the extreme apex; superior appendages from above, rather long; to each appendage there is an inner ridge carrying a stout spur whose extreme apex is blackened; this spur may be seen, both from above and beneath, projecting beyond the inner margin; from the side, the appendage is broad, broader at its base; intermediate appendages from the side, concealed by the superior appendage; they are very broad at the bases narrowing to strongly chitinised blackened and slightly hooked apices directed upwards and, from above, slightly outward; penis from the side deeply notched on the underside before the apex which carries two slender spines on its underside directed

downwards and towards the base; penis-sheaths long and slender, curving slightly upwards from the side, divergent from beneath; inferior appendages welded to the sides of the ninth segment; from above narrow, apices directed slightly inward; from the side, the apices appear slightly twisted; lower margins strongly fringed; margin of the terminal ventral segment widely excised.

♀ General appearance resembling that of the ♂; genitalia.—From above, terminal dorsal segment produced and rounded; from beneath, can be seen below this segment two large rounded lobes; vulvar scale with a slender central piece extending slightly beyond the outer lobes whose apical margins are sinuous.

Length of anterior wing ♂ 9 mm.

Length of anterior wing ♀ 9.5 mm.

Western Tibet; Pangur Tso, 14,203 ft., 13-14-viii-1932, G. E. Hutchinson, Yale North India Expedition.

Type ♂ and paratypes ♂ and ♀ in the collection of the British Museum; other paratypes in the collection of the Yale University, U.S.A., all from the same locality.

A. tricalcaratus closely resembles Martynov's *A. alaicus* in the genitalia but differs vastly in general appearance and in having only 3 spurs to the posterior leg.

Micropterna Stein.

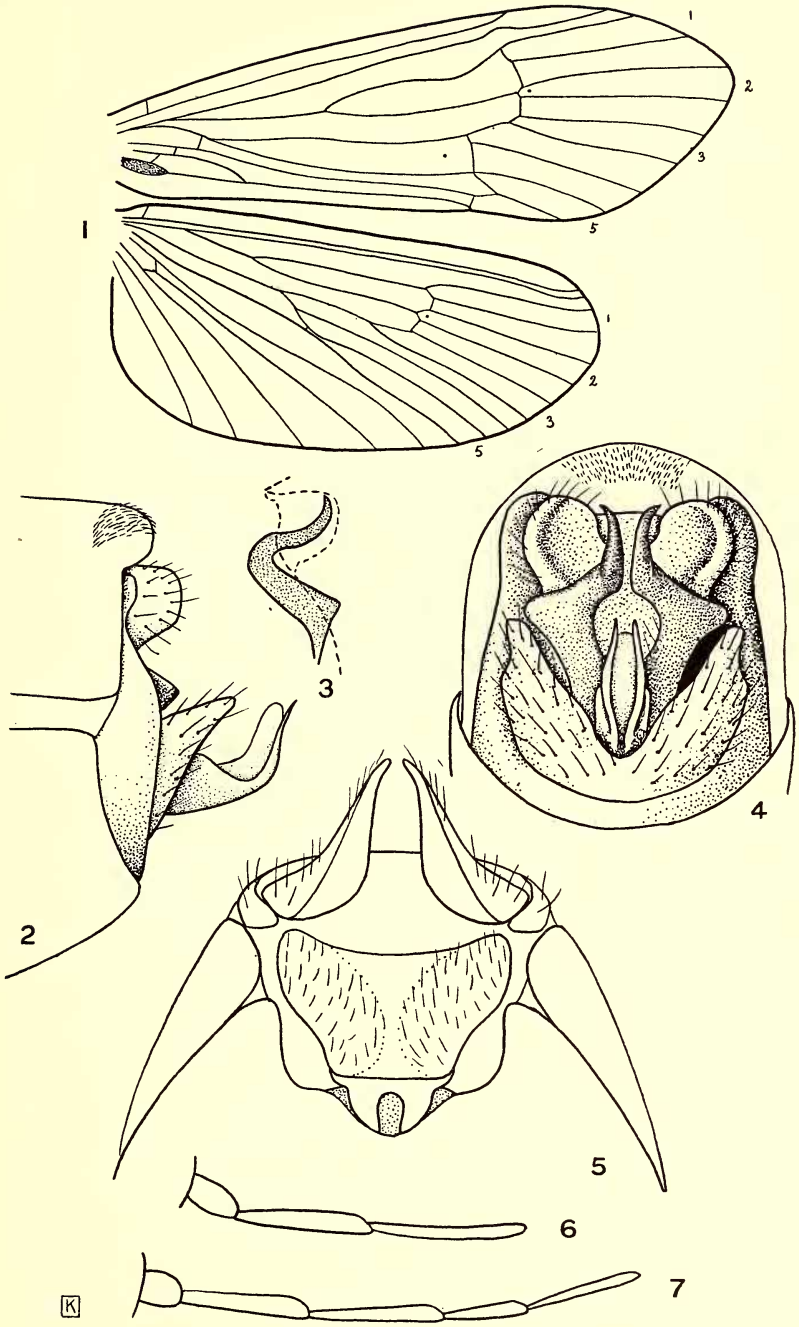
Micropterna Stein.—Stett. Ent. Zeit., p. 247, 1874; McLachlan.—Rev. and Syn. Trich., p. 137, 1874; Ulmer.—Gen. Insect., fasc. 60a, p. 53, 1907.

Antennae rather slender and shorter than the anterior wings; maxillary palpi ♂, first joint very short and rounded, second and third long; ♀, first joint very short, remaining joints long, with the fourth slightly shorter than the others. In the anterior tarsi of the ♂, the basal joint is very much shorter than the second joint and is sometimes thickened; spurs generally 0, 3, 4 or 0, 3, 3 in the ♂ and 1, 3, 4 in the ♀ but in the single described Indian species, the spurs are doubtful and appear to be 0, 2, 2 in the ♂ and 1, 2, 2 in the ♀. Anterior wings ordinarily elongate and broad with the apices sometimes rounded, sometimes sub-acute, costal margin more or less arcuate, pterostigma as a rule absent, discoidal cell strongly excised on its upper edge, first apical cell somewhat rounded at the base, third and fifth sub-acute, second and fourth slightly truncate; posterior wings broad, not perceptibly excised below the apex; the margin of the eighth dorsal segment is generally inturned and densely clothed with short black setae.

Genotype: *Micropterna testacea* Gmelen.

Micropterna indica sp. n. (Pl. IV, figs. 1-7).

Head ochraceous, antennae ochraceous, long and slender, palpi of the same colour; mesothorax ochraceous in the centre with wide black patches on each side; metathorax with two rounded black patches. Wings large, anterior rather long, apex sub-acute, pale stramineous, rather darker along the costa and sub-costa



Micropterna indica sp.n., Fig. 1, wings ♂. Fig. 2, genitalia ♂, lateral. Fig. 3, portion of intermediate appendage, lateral. Fig. 4, genitalia ♂, from behind. Fig. 5, genitalia ♀, ventral. Fig. 6, maxillary palpus ♂, Fig. 7, maxillary palpus ♀.

and towards the pterostigma which is only slightly indicated; in both sexes there is a narrow cell towards the base pigmented entirely with dark ochraceous; posterior wing broad, pale ochraceous. Legs ochraceous. Spurs of the anterior legs, 0 in the ♂ and 1 in the ♀; on the median and posterior legs doubtfully 2 in both sexes.

Genitalia ♂.—Margin of the eighth dorsal segment truncate and set with a close mass of rather pale coloured setae as compared with the black setae of most European species in the genus; superior appendages small and rounded, not visible from above and appearing as rounded lobes from the side; intermediate appendages only visible from behind, stout, black, their centres approximating each other, apices directed outward, bases diverging widely; penis slender, sheaths very slightly longer than the penis; as seen from the side, broad at the base narrowing abruptly at the centre and from there directed upward in a slender spine; inferior appendages from the side, wide at the base and tapering rather suddenly to a blunt apex.

Genitalia ♀.—From beneath, the abdomen terminates in a pair of finger-like processes, broad at their bases, apices acute; below these are two reniform, strongly chitinised hairy plates towards the base of which is the vulvar scale with broadish wings and a small central lobe.

In both sexes the margins of the sixth and seventh ventral segments are set with minute teeth.

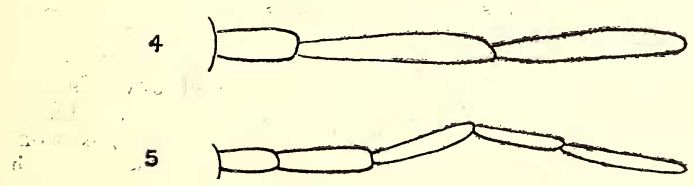
Length of anterior wing ♂ 18 mm.

Length of anterior wing ♀ 20 mm.

Type ♂ and paratype ♀ taken coupled, Kashmir, ft. 5,600, Khanabal, 20-ix-1923, Dutt. Coll. from the collection of the Imperial Institute of Agricultural Research, Pusa, Bihar, now in the collection of the British Museum.

Pseudostenophylax Mart. (Text-figs. 4-5).

Pseudostenophylax Martynov.—Ann. Mus. Zool. Acad. Imp. St. Peters, vol. xiv, pp. 281-2, 1909; Proc. Zool. Soc. Lond., Pt. I, No. 6, pp. 91-2, 1930.



Figs. 4–5. *Pseudostenophylax himalayanus* Mart., Fig. 4, maxillary palpus ♂. Fig. 5, maxillary palpus ♀.

♂ Maxillary palpi slender, first joint short, second and third more than twice the length of the first. ♀ first joint short,

second nearly twice its length, third and fifth longer than the second, fourth as long as the second. Spurs 1, 3, 4. Terminal joint of each tarsus without spines (or with two or three very short ones only); anterior wings broad, rounded at the apices, greyish-yellow or testaceous with yellow spots; nervures strong; membrane granulose with very short semi-erect hairs; discoidal cell very long, much longer than its foot-stalk. Posterior wings sub-hyalin, posterior margin excised in the region of fork No. 5, fourth apical cell as broad as the second; in the anal region of the ♂ wing there are specialised hairs or scales.

Genotype: *Pseudostenophylax fumosus* Mart.

Pseudostenophylax martynovi sp.n. (Pl. V, figs. 1-6).

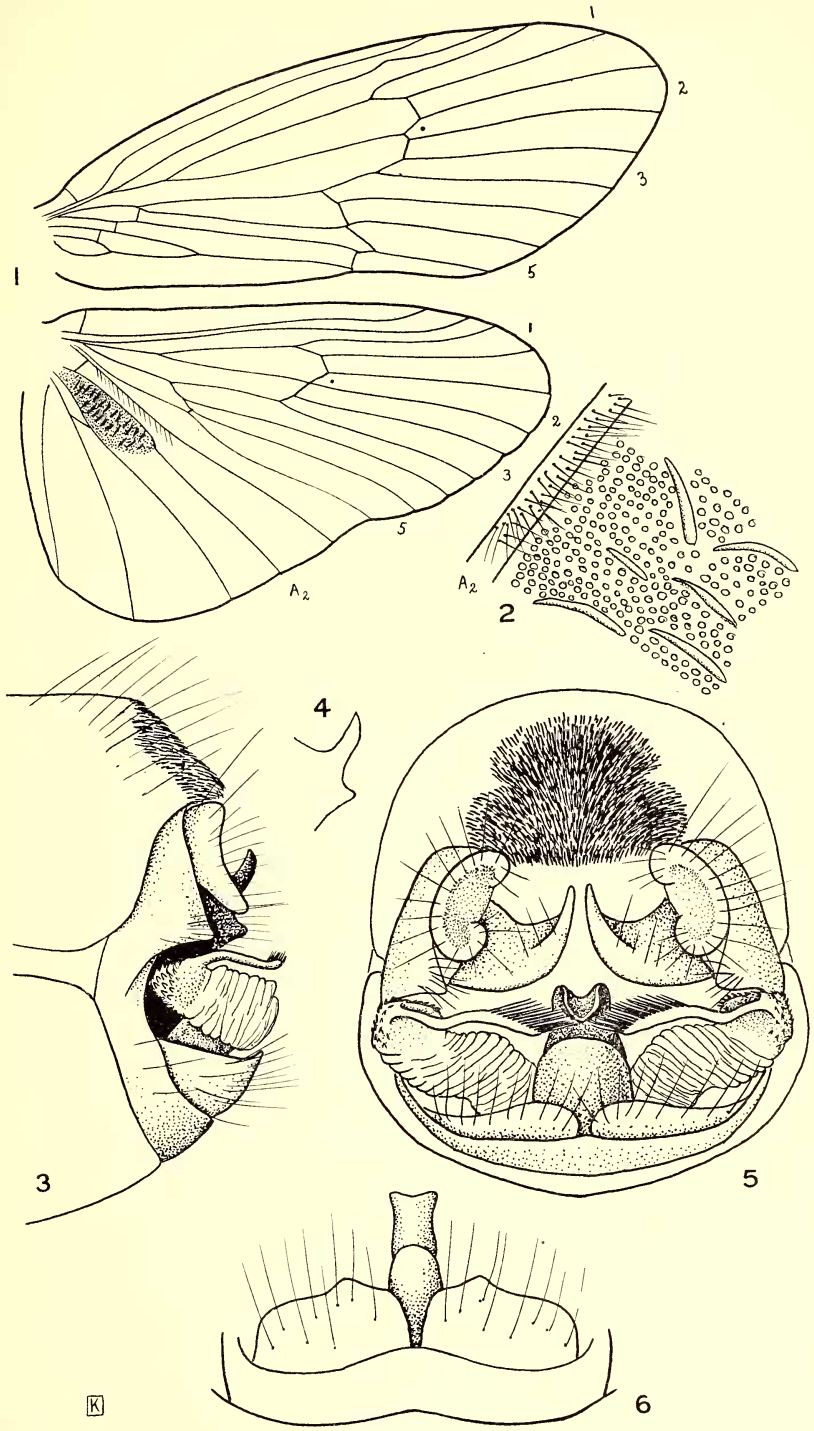
Pseudostenophylax himalayanus Martynov *partim*.—Proc. Zool. Soc. London, Part I, No. 6, pp. 92-5, figs. 37-41, 1930.

Head dark ochraceous, antennae and palpi pale ochraceous; wings, anterior, brownish irrorated with round yellowish spots; membrane granulose with numerous semi-erect and very fine black hairs and with a mass of dense black hairs fringing the costa making a narrow black rim to the costal margin. There is a dense mass of black hairs in the subcostal region at the base of the wing. Membrane of the posterior wing finely granulose, covered with small semi-erect dark hairs; at the base of the second anal vein is a long, rather broad yellowish area free from hairs but set transversely with some wide yellowish wax-like scales, the structure of which is very obscure. There is no fringe of scales clothing the second anal vein as in *himalayanus* and the yellowish area is confined to basal third of the vein. Basal portion of the wing deeper in proportion to its length than in *himalayanus*.

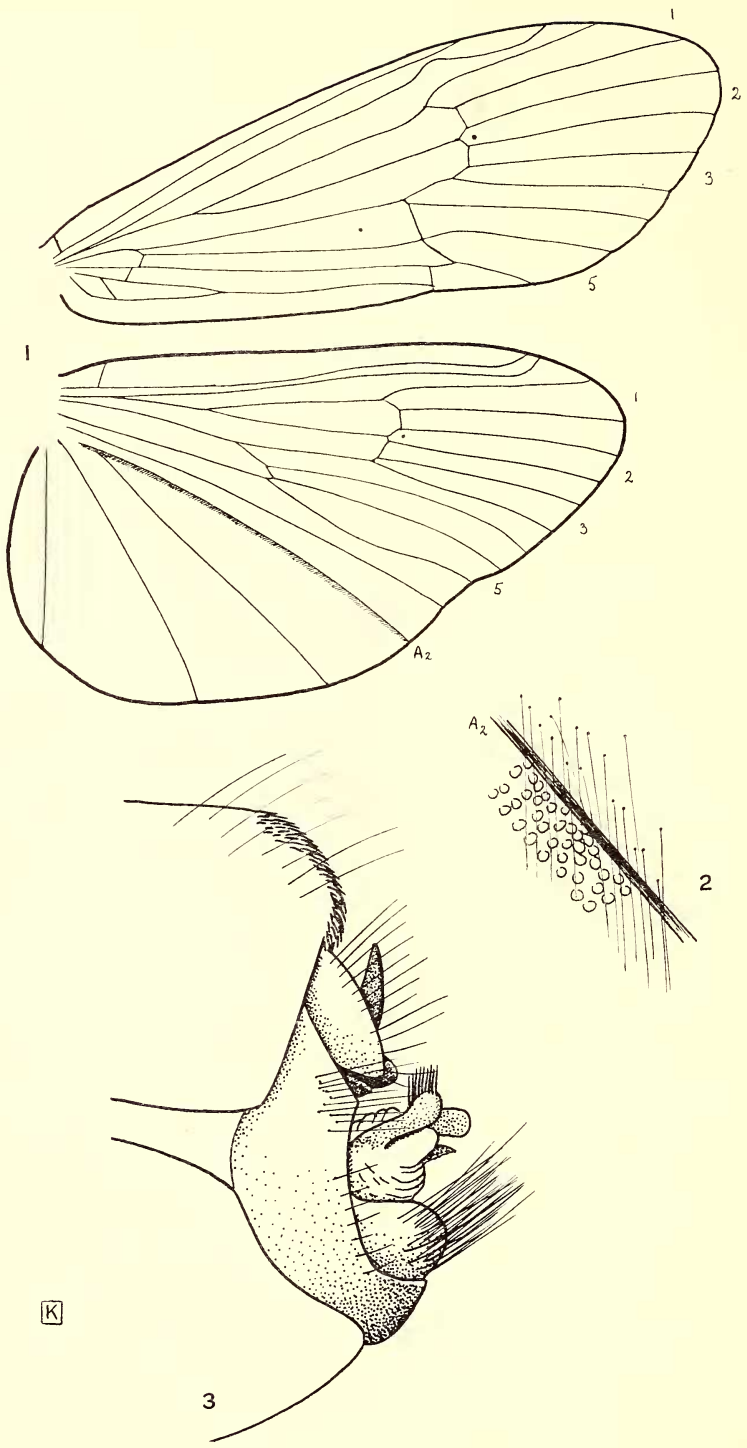
Genitalia ♂.—The margin of the eighth dorsal segment is produced and clothed with a dense mat of black setae which continue not very far round to the under side; there is a raised centre portion of the margin also densely covered with black setae. Side-pieces of the ninth segment triangular with acute apices; superior appendages from behind, ear-shaped, margins fringed with long black hairs; from the side, deep and narrow, apical margin concave, distinguishing the species from *himalayanus* in which the margin is convex; between these appendages, seen from behind, are the intermediate appendages broad at the base with narrow, pointed yellowish apices directed upwards and placed side by side; from the side, the base of the appendage projects nearly at right-angles; penis short and stout, apex from behind excised; lower penis-cover trough-shaped, set close beneath the penis; penis-sheaths with broad membranous bases and narrow strongly chitinised terminal portions bent inwards horizontally, apices furnished with stiff bristles; inferior appendges small and broad, margins fringed with long hairs and bearing slight projections towards the inner angles as seen from beneath; from the side, broad at the base, apex produced in a small blunt finger.

Length of anterior wing ♂ 21 mm.

Tibet; Yatung, 4,500 ft., A. E. Hobson.



Pseudostenophylax martynovi sp.n., ♂. Fig. 1, wings. Fig. 2, anal area of left posterior wing showing scales, enlarged. Fig. 3, genitalia, lateral. Fig. 4, apex of intermediate appendage, lateral. Fig. 5, genitalia, from behind. Fig. 6, inferior appendages, penis and lower penis-cover, etc., ventral.



Pseudostenophylax himalayanus Mart., ♂. Fig. 1, wings. Fig. 2, portion of right posterior wing around A2, enlarged. Fig. 3, genitalia, lateral.

Type ♂ in the British Museum collection, abdomen mounted in balsam.

Pseudostenophylax himalayanus Martynov (Text-figs. 4-5; Pl. VI, figs. 1-3).

Pseudostenophylax himalayanus Mart. *partim.*—Proc. Zool. Soc. London, Pt. I, No. 6, pp. 92-5 but not figs. 38-41.

Head dark ochraceous; antennae, basal joint yellowish, remainder still paler with no apparent annulations, palpi and legs ochraceous. Wings, anterior, broad, rounded at the apices, membrane yellowish, granulose with short semi-erect yellowish hairs with rather larger blackish hairs in the sub-costal area darkening the base of the wing in this region; costa fringed with very short adpressed black hairs. The wing is irrorated, particularly in the post-costal region with round yellowish spots. Posterior wing yellowish, finely granulose with a dense row of thick whitish scales clothing the second anal vein to the margin of the wing. The basal portion of the wing is not so deep in proportion to its length as in the preceding species, *martynovi*.

Genitalia ♂.—Points of difference between the genitalia of *himalayanus* and *martynovi* few, and are as follows:—

There is no raised upper portion of the setae-clad margin of the eighth dorsal segment; superior appendages from the side with the outer margins convex instead of concave; the terminal portions of the penis-sheaths much broader; inferior appendages from the side, rounded, the apices are not acute as in *martynovi*.

Length of anterior wing ♂ 20 mm.

Tibet: Yatung, 4,500 ft., A. E. Hobson.

Type ♂ with the abdomen mounted in balsam, in the collection of the British Museum.

In the course of the examination of the examples of *P. himalayanus* in the British Museum collection for the purposes of this revision, it was discovered that the two ♂ examples collected by A. E. Hobson in Tibet, remaining in the British Museum, represented two distinct species.

In the light of the discovery, it became apparent that Martynov's description of the wings, more particularly of the posterior wing with its provision of scales 'in a dense row' clothing the vein A_2, referred to the one species but his figures of the genitalia, to the other. This is clearly evidenced by the concave outer margin of the superior appendage as seen from the side.

As the more important characters separating the two species are to be found in neuration, particularly the arrangement of the scales on the posterior wing, I have fixed the type of *himalayanus* as the species bearing the dense row of thick whitish scales. Martynov's figures of the genitalia (figs. 38-41, Proc. Zool. Lond., p. 93, 1930) agree perfectly with mine from the cleared abdomen of *martynovi*.

With regard to the ♀♀, it is impossible to say with certainty, with which species they should be associated and I therefore abstain from including descriptions here.

Pseudostenophylax griseolus Mart. (Pl. VII, figs. 1-4).

Pseudostenophylax griseolus Mart.—Proc. Zool. Soc. Lond., Pt. I, No. 7, pp. 97-8, 1930.

♀ 'Head reddish-brown above, testaceous in front; ocelli large, whitish; antennae brown, with distinct pale annulations; palpi testaceous. Thorax reddish-brown above, metanotum paler; underside of the thorax reddish-yellow. Legs yellow with black spines; spurs 1, 3, 3 yellow; on anterior tibiae some brownish spots around groups of spines; anterior tarsi also brownish. Anterior wings rather narrow with apical margin rounded; membrane granulose with minute hairs; pale brownish-grey irrorated with numerous small round hyaline spots; costal and sub-costal areas greyish-yellow; dorsal portion behind *Cu* brown, with distinct hyaline spots. *DC* very long, first apical fork impinging only slightly further inward than the second; cross vein *rs-m* equal to *irs* but oblique. Posterior wings sub-hyaline, minutely granulose and hairy; first apical fork impinging not further inward than the second. Abdomen dark brown, ochraceous beneath. Ninth segment rather broad in dorsal part, ventral portion projecting considerably backward and rounded if seen from the side. Subgenital apparatus composed of a very small median-lobe and two large pale testaceous side-lobes, concave on their inner posterior margins. Superior appendages fused with tenth segment, hairy, triangular as seen from above, united at their bases, apices produced in two slender stick-shaped processes. Side-lobes of tenth segment rounded in profile, broadly divided by a median excision beneath.

Length of body 8 mm. Expanse 27-28 mm.

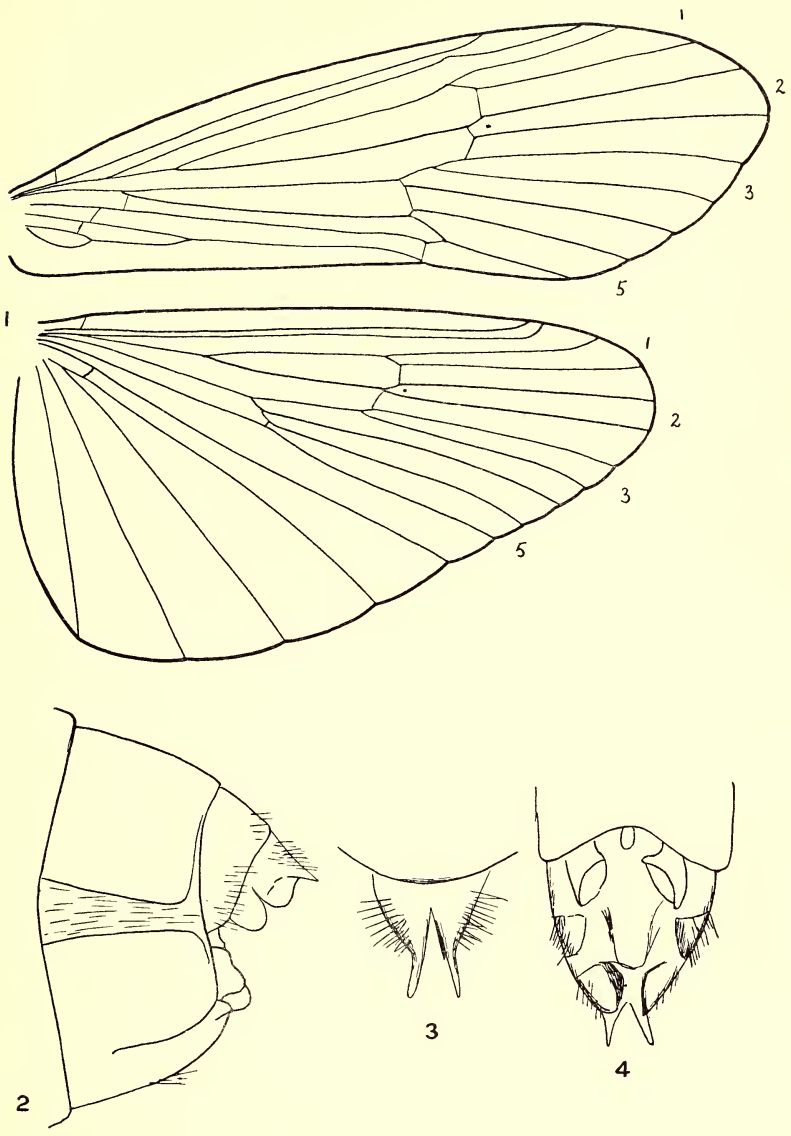
3 ♀♀ Sikkim: Khamba Jong, 15,000-16,000 ft., 15-30-vii-1903, Tibet Expedition, Lt.-Col. H. J. Walton.

The above is Martynov's description with reproduction of his figures. I am opposed to the description of new species from female types and have not therefore re-described and re-figured the species myself. I am inclined to the opinion that, having regard to the spur formula 1, 3, 3 and the shape of the posterior wing which is not perceptibly excised beneath the apex as in *Pseudostenophylax* species, *griseolus* might be better placed in the genus *Pseudohalesus;* in the absence of the male, I am not prepared to make a definite pronouncement.

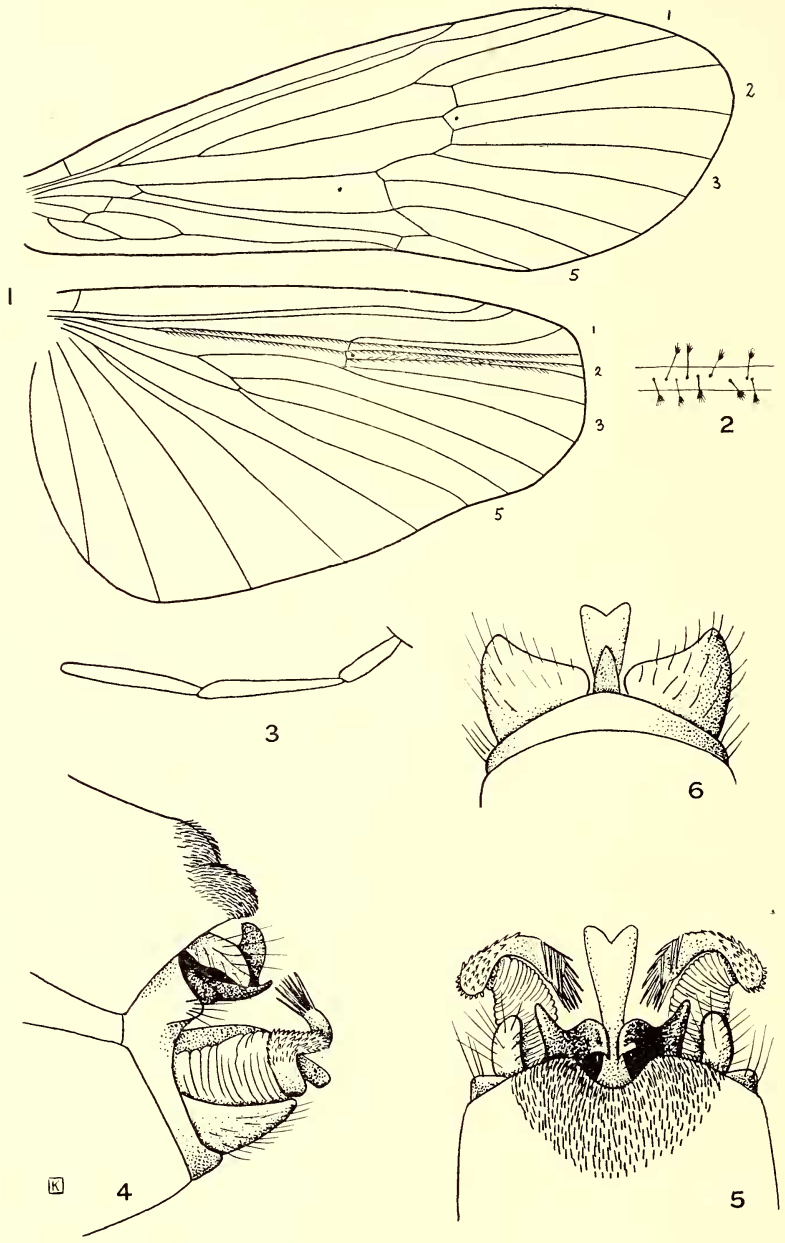
Astenophylodes gen. n.

This genus may be separated from the nearly related *Pseudostenophylax* partly by the presence of spines on the terminal tarsal joint but mainly by the structure of the posterior wing.

Anterior wings rather elongate, apices sub-acute, discoidal cell long and narrow; posterior wing, discoidal cell long and reduced in width to dimensions quite unknown in any other recorded *Limnophilid* genus; the two branches of the sector enclosing this



Pseudostenophylax griseolus Mart., ♀. Fig. 1, wings. Fig. 2, genitalia, lateral. Fig. 3, dorsal. Fig. 4, ventral (genitalia after Martynov).



Astenophylodes burmanus sp.n., ♂. Fig. 1, wings. Fig. 2, specialised hairs of posterior wing, enlarged. Fig. 3, maxillary palpus. Fig. 4, genitalia, lateral. Fig. 5, dorsal. Fig. 6, inferior appendages, penis and lower penis-cover, etc., ventral.

cell as also the second, third and fourth apical sectors carry rows of peculiarly formed scales each set on a long foot-stalk with a dilated head somewhat of the pattern of the *Lepidopterous battledor* scales. Forks Nos. 1, 2, 3 and 5 in both anterior and posterior wings present. Antennae rather slender, nearly as long as the anterior wing, basal joint large and dilated on its inner margin, adjacent joint very short and the next more than twice as long and longer than each of the remaining joints. Maxillary palpi ♂, basal joint about half the length of the second which is as long as or slightly longer than the third. Spurs 1, 3, 4.

Genotype: *Astenophylodes burmanus* sp. n.

Astenophylodes burmanus sp. n. (Pl. VIII, figs. 1-6).

Head dark fulvous; ocelli greenish-yellow; antennae, basal joint ochraceous, remaining joints fulvous with ochraceous annulations; palpi ochraceous; mesothorax fulvous with large, nearly black lateral markings.

Wings, anterior, dark fulvous with numerous yellowish irrorations, veins dark ochraceous, membrane granulose with innumerable short erect black setae, post-costal area beset with longish recumbent black hairs so that the wing is considerably darkened in this area; narrow darkened borders to the apical veins giving the wings a somewhat striate appearance; posterior wing also granulose, for the rest, as detailed in the generic description. Legs ochraceous with dark patches at the bases of each tarsal joint, spines black.

Genitalia ♂.—Margin of the eighth dorsal segment rounded, set with dense black setae to a considerable depth and with a deep semicircular excision at its centre; superior appendages short and yellowish furnished with rather long hairs particularly along the inner margins; intermediate appendages very strongly chitinised with bifurcate blackened apices, outer forks long and slender, inner wide and rounded as seen from above; from the side the inner fork has an outer convex margin and is directed upward and slightly backward; outer fork slender and directed backward; there is a small rounded lobe at the base of each appendage on its outer side; side-pieces of the ninth segment somewhat produced and triangular, set with long hairs; penis long and straight, apex dilated and widely excised; lower penis-cover strongly chitinised, narrow and tapering to a point; penis-sheaths membranous, from above, the apical extremities curved and lying transversely across the basal stem, outer ends of these transverse portions rounded and set with short teeth, inner ends with long stiff bristles; inferior appendages from beneath, short and broad, apices obliquely truncate, outer angles produced; margin of the ninth ventral segment produced at its centre.

Length of anterior wing ♂ 16 mm.

♀ unknown.

Burma 28°N., 97° 24″E., 11,000 ft., 29-vi-1926, F. Kingdon Ward.

Type ♂ in the British Museum collection, abdomen mounted in balsam.

Stenophylina Mosely.

Stenophylina Mosely.—Entom., lxix, p. 13, 1936.

Maxillary palpi with the basal joint about half the length of the second which is equal to the third; antennae long and stout, basal joint large and rounded, next joint very short, third longer, about two-thirds the length of the basal joint and longer than the following joints. Anterior wings broad, costal margin rounded, radius bent towards its apex nearly to meet the sub-costa; forks Nos. 1, 2, 3 and 5 present, all sessile; discoidal cell long and narrow; cellula thyridii long and narrow, extending towards the base beyond the cross-vein joining the cubitus and the first anal vein.

Posterior wing with forks Nos. 1, 2, 3 and 5, all sessile; there is a well-developed frenulum situated on the basal half of the costa, consisting of very long fine hairs; anal area produced in a large triangle; discoidal cell long and narrow.

Spurs 1, 3, 4. For genital characters, reference should be made to the description of the single species *mitchelli*.

Genotype: *Stenophylina mitchelli* sp. n.

The genus is evidently related to Martynov's *Pseudostenophylax* having regard to the genitalia, but the posterior wing lacks the specialised hairs or scales which is so characteristic of that genus.

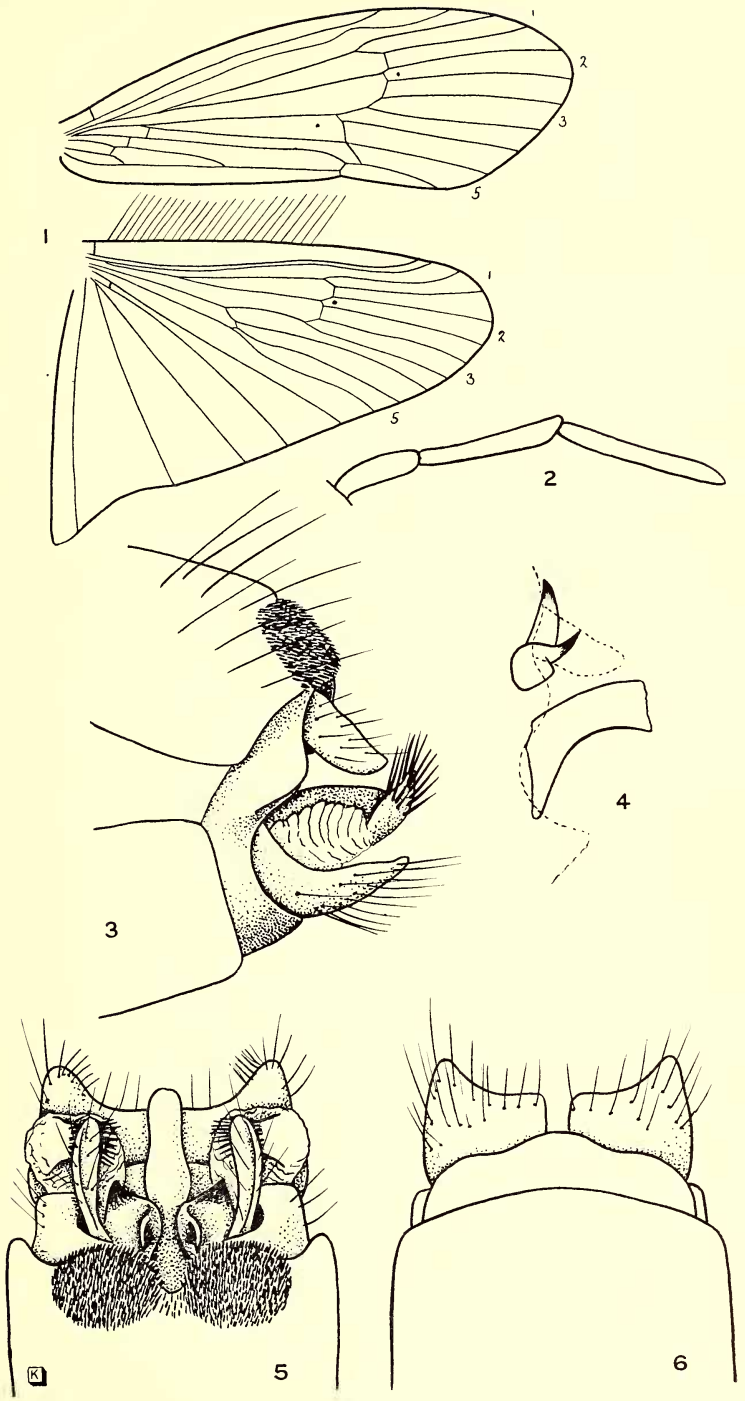
Stenophylina mitchelli Mosely (Pl. IX, figs. 1-6).

Stenophylina mitchelli Mosely.—Entom., lxix, pp. 13-14, 1936.

The two examples of this species are both mounted as balsam preparations. The wings are large and brown and the insects bear a general resemblance to species of the genus *Pseudostenophylax* but the costal margin of the anterior wing is far more rounded and the very extraordinary development of the anal region of the posterior wing renders this insect amply distinct from the *Pseudostenophylax* species. The general characters are given in the description of the genus.

Genitalia ♂.—The margin of the terminal dorsal segment is produced at its centre in two large rounded lobes closely set with minute black setae and with a deep excision between; superior appendages small and narrow; intermediate appendages from above broad and triangular, inner angles produced in strong black teeth directed upwards, apical angles also blackened; from the side, the apical angle appears as a short, slightly curved spur and the inner angle as a well-developed and much larger black upwardly-directed tooth. Penis from above, long, dilated slightly at the centre, apex rounded; from the side it curves slightly downward with a truncate apex. Penis-sheaths long and membranous, apices furnished with long bristles or teeth. Inferior appendages very broad, nearly quadrangular, apices truncate with the outer apical angles slightly produced; from the side the appendage is rather narrow with a concave upper margin and acute apex; the margin of the terminal ventral segment produced slightly at its centre.

Length of anterior wing ♂ 16 mm.



Stenophylina mitchelli sp.n., ♂. Fig. 1, wings. Fig. 2, maxillary palpus. Fig. 3, genitalia, lateral. Fig. 4, intermediate appendages and penis, lateral. Fig. 5, genitalia, dorsal. Fig. 6, inferior appendages, etc., ventral.

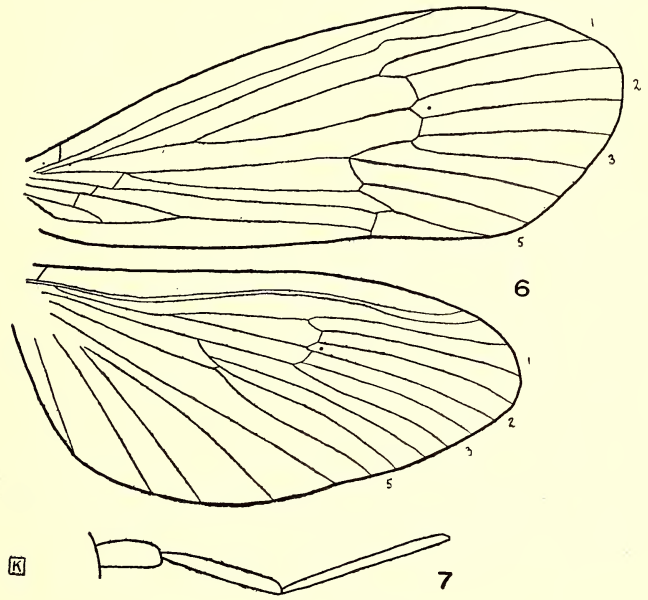
Kashmir: Lake Vishensar 12,000 ft., F. J. Mitchell.

Type ♂ and paratype ♂ in the author's collection, both mounted as balsam preparations, one pair of wings of the type mounted dry.

I dedicate this species to the memory of the late F. J. Mitchell to whom is due the introduction of trout into Indian waters and who took a keen interest in the entomology of Kashmir in its relationship to trout food.

Trichophylax gen. n. (Text-figs. 6-7).

Antennae broken away at the second basal joints in the unique example; basal joint long, second joint very short; maxillary palpi ♂, basal joint short, stout, about half the length of the second,



Figs. 6–7. *Trichophylax rotundipennis* sp.n., Fig. 6, wings ♂. Fig. 7, maxillary palpus ♂.

third nearly half as long again as the second. Anterior wing, membrane granulose with erect black hairs particularly along the veins, apex broad and rounded, costa rounded; posterior wing only slightly broader than the anterior, also granulose with very small erect hairs; discoidal cell long in both wings. Spurs 1, 3, 4 (?), rather difficult to make out in the single example. Dorsal segments of the abdomen bearing long fine silky hairs. Genitalia conforming to the general pattern of the *Pseudostenophylax* group.

Genotype: *Trichophylax rotundipennis* sp. n.

This is the first Trichopteron I have seen with an abdomen provided with long fine hairs along the dorsal segments.

Trichophylax rotundipennis sp. n. (Pl. X, figs. 1-3).

Head dark fulvous, paler next to the oculi; antennae, palpi and legs fulvous. Other characters are given with the generic description.

Genitalia ♂.—The margin of the eighth dorsal segment bears at its centre a mat of unusually coarse black setae, the centre itself is produced and elevated so that the setae appear more dense in this region; superior appendages from above, short and slender, curving inwards and fringed with long hairs; from the side, broad at the base and tapering to a rounded apex; intermediate appendages from above appear as ear-shaped processes with blackened rims curving upwards at their inner and still more blackened margins; from the side the appendage appears as an upwardly directed rather stout process. Penis short and straight with a collar below the apex; penis-sheaths strongly developed with dilated triangular apical parts fringed with stout bristles and with the upper and lower apical angles bent sharply inward; inferior appendages short and broad, each with a short slender process arising from the interior margin towards the inner angle; the margins of the eighth and ninth ventral segments produced at their centres; there is a patch of short bristles on the eighth sternite towards the centre of its margin.

Length of anterior wing ♂ 16 mm.

Punjab: Murree, 6-ix-86. 46-83.

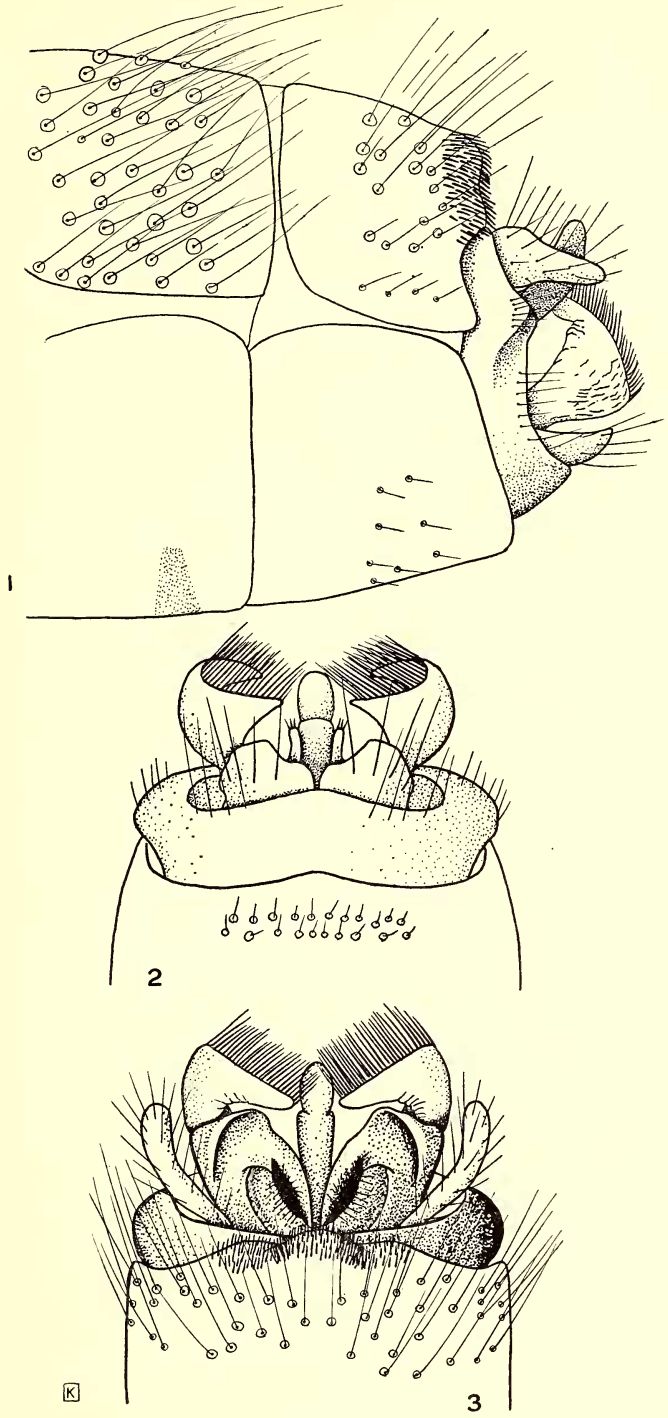
Type ♂, with the abdomen mounted in balsam, in the British Museum collection.

This species was found in the British Museum collection over the name *Stenophylax micraulax* McL. It is evident however that it has been wrongly determined. *S. micraulax*, as described by McLachlan, is characterised by a groove along the costal margin of the anterior wings, filled with black hairs and should therefore be placed in Martynov's genus *Pseudohalesus* (and not in *Pseudostenophylax* as Martynov suggests in Ann. Mus. Zool. Ac., 1927 and again in the Proc. Zool. Soc. Lond., 1930).

Pseudohalesus Martynov.

Pseudohalesus Martynov.—Ann. Mus. Zool. Acad. Sci. U.S.S.R., vol. xxviii, pp. 480-1, 1927.

Antennae rather short, basal joint bulbose, next joint very short, the next about three times longer and about twice as long as the following joints. Maxillary palpi of the ♂ with the basal joint very short, second and third long and equal; ♀, basal joint half the length of the second, third slightly longer than the second, fourth as long as the second, fifth slightly longer than the fourth. Anterior wings brownish, usually obliquely truncate at their apices, membrane granulose with numerous semi-erect, very short black hairs, rather longer along the veins; along the costal margin towards the base is a narrow fold filled with short black specialised hairs; the posterior wings are without the specialised hairs or



Trichophylax rotundipennis sp.n., ♂. Fig. 1, terminal abdominal segments and genitalia, lateral. Fig. 2, ventral. Fig. 3, dorsal.

scales found in *Pseudostenophylax*, membrane rather more granulose than usual and, as in the anterior, carrying numerous semi-erect hairs but smaller and less dense than in that wing; discoidal cell in both wings long. Legs, first joint of the anterior tarsus long, carrying a mat of short black setae along its under surface, spines black, few in number and absent on the terminal tarsal joint; spurs 1, 3, 3.

Genotype: *Pseudohalesus asiaticus* Ulmer.

Pseudohalesus kaschmirus Mart. (Text-fig. 8).

Pseudohalesus kaschmirus Mart.—Ann. Mus. Zool. Acad. Sci. U.R.S.S., xxviii, Pt. 1, pp. 481-2, Pl. XXV, figs. 1-3, 1927.

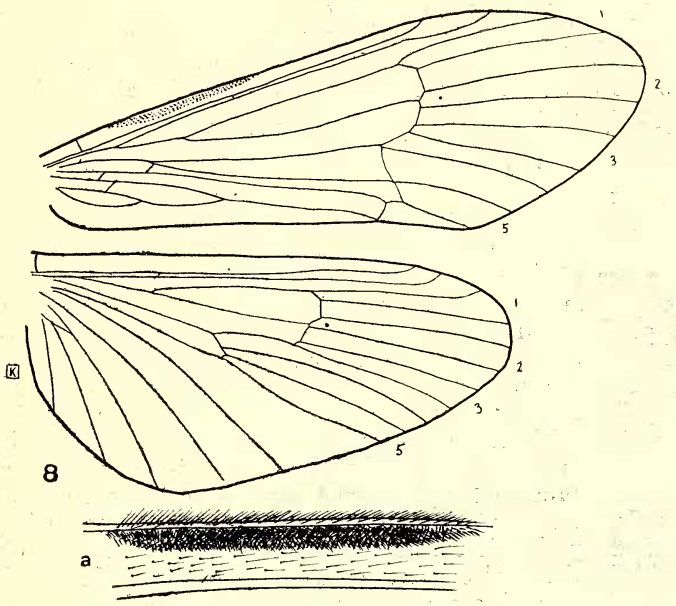


Fig. 8. *Pseudohalesus kaschmirus* Mart., wings ♂. 8A. costal area of anterior wing more enlarged.

This species is to be distinguished from *P. aberrans* only by its neuration and size. I have been able to find no satisfactory distinctions in the genitalia by which to separate the two species.

On a comparison of the figures of the wings of the two insects, it will be noticed that in both anterior and posterior, fork No. 1 is of normal width in *kaschmirus* and exceptionally narrow in *aberrans;* in the former species, fork No. 3 is present in both wings, in the latter, generally absent, in occasional examples present perhaps only in one wing and then unusually narrow.

Length of anterior wing ♂ 15 mm.

Western Tibet: Chagra, 15,215 ft., 4-vii-1932, G. E. Hutchinson, Yale North India Expedition; Kashmir, 7-8-vi-1910.

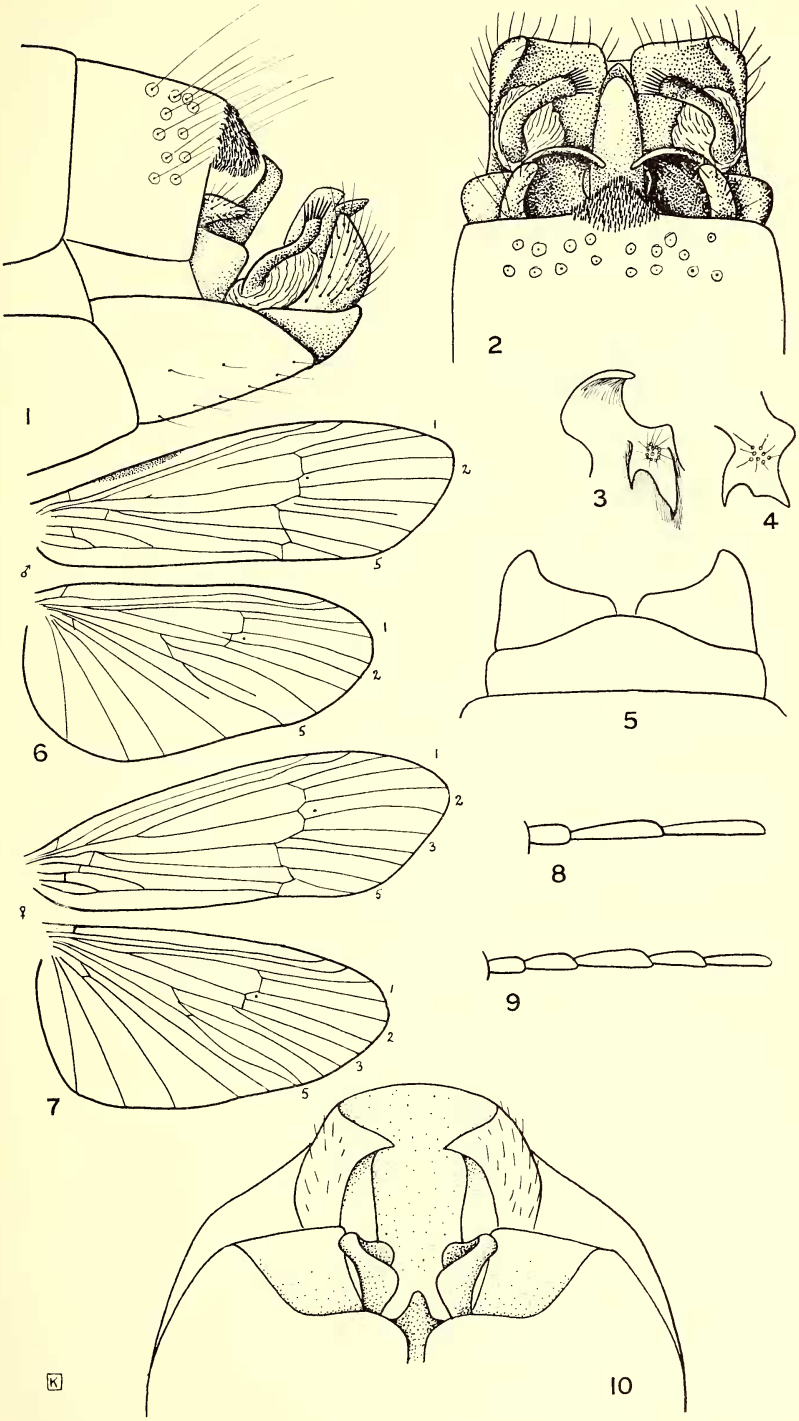
Pseudohalesus aberrans sp. n. (Pl. XI, figs. 1-10).

Head dark fulvous; ocelli white and rather prominent; antennae fulvous with paler annulations; palpi and legs pale fulvous. Anterior wings warm fulvous with yellowish irrorations more numerous in the post-costal region, membrane granulose, set with black erect hairs very long on the veins and closer together and more recumbent in the post-costal region so that the wing is considerably darkened in this area; in the ♂ there is a groove along the costa towards the base filled with specialised black hairs as indicated in the generic description; in this sex also the anterior wings in each example of a series of four, show varying aberrations in neuration but all agree in the absence of fork No. 3 which is absent also in the wings of one of the females represented but present in those of the other; other aberrations are too variable for description and consist mainly of broken nervures, in particular the sector so that in several examples (♂), the discoidal cell is only partially enclosed, the upper basal margin being wanting; membrane of the posterior wings weakly granulose with short but much less conspicuous black or brownish hairs than on the anterior wings. Fork No. 3 sometimes present, sometimes absent.

Genitalia ♂.—Margin of the eighth dorsal segment which is produced in a black tongue towards the centre, closely set with a mass of short black setae which form a mat, not only on the tongue but also over a considerable area beneath it; superior appendages from above, very small and narrow, curving slightly inward and fringed with long hairs; intermediate appendages somewhat complex and varying in detail in individuals; there is a pair of broad plates, as seen practically from behind, set side by side with the inner margins deeply concave so that between the two there is a nearly circular excision, inner apical angles slightly produced and turned over, from the side, directed upward; these plates form the bases for processes which are concealed by the dorsal segment and can only be seen directly from behind; they arise from towards the inner angles of the bases of the plates and are strongly chitinised and blackened; they vary in shape in individuals as indicated in the figures but agree in having small warts covered with long hairs at their bases; penis short and straight, sheaths membranous, no doubt extensile to judge by the creases in the membranes, apices set with long bristles; inferior appendages very broad, apices sinuous, nearly truncate, outer angles slightly produced.

Genitalia ♀.—The structure is only visible from directly behind; the ninth segment is produced at the centre of its lateral margins in two acute triangles directed inwards; below this is the vulvar scale with a pair of leaf-like, rather broad and sinuous lateral processes with a very small central lobe between. In both sexes the margin of each ventral segment carries a pair of nearly parallel rows of bristles separated from each other slightly towards their centres to enclose a narrow clear space (excepting the eighth where the bristles are closer together).

Length of anterior wing ♂ 10-12 mm.



Pseudohalesus aberrans sp.n., Fig. 1, genitalia ♂, lateral. Fig. 2, dorsal. Fig. 3, intermediate appendage, dorsal. Fig. 4, basal plate of the appendage from another specimen. Fig. 5, inferior appendages, etc., from beneath. Fig. 6, wings ♂. Fig. 7, wings ♀. Fig. 8, maxillary palpus ♂. Fig. 9, ♀. Fig. 10, genitalia ♀, ventral.

Length of anterior wing ♀ 11 mm.

Western Tibet; Kyam, about 15,500 ft., 19-25-vii-1932, C. E. Hutchinson, Yale North India Expedition.

Type ♂ in the British Museum collection, mounted in balsam, one pair of wings dry. Paratypes ♂♂, ♀♀ from the same locality in the British Museum and Yale University collections.

All the species of the series were found dead under stones. This is a strange insect and I can find no satisfactory variation in genitalia on which alone to separate the species from *P. kaschmirus* Martynov. Had I been confronted with a single example, I should unhesitatingly have considered it as merely an aberrant dwarfed form of this species. But having regard to the fact that Mr. Hutchinson obtained a series of no less than six examples, it is impossible to believe that in nearly all, a mere aberration could take the same form, i.e., the absence of fork No. 3 in both wings.

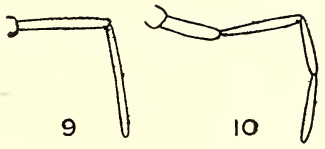
Halesinus Ulmer (Text-figs. 9-10).

Halesinus Ulmer.—Notes Leyden Mus., xxix, No. 1, pp. 3-4, fig. 3, 1907; Gen. Insect., fasc. 60a, pp. 57-8, Pl. V, fig. 38, 1907.

The genus *Halesinus* was erected by Ulmer to take a single ♀ species *tenuicornis* and the generic characters have been selected in accordance with the characters of this ♀. Subsequently Martynov described another ♀, *ussuriensis*.

The first ♂ to be recorded was found in the collection of the British Museum, from Tibet, and described by Martynov, in 1930, in the Proc. Zool. Soc. Lond., under the name *albipunctatus*.

Martynov described both sexes but does not figure the ♂ wings nor extend the generic description to cover this sex.



Figs. 9–10. *Halesinus albipunctatus* Mart., Fig. 9, maxillary palpus ♂. Fig. 10, maxillary palpus ♀.

When, for the purposes of this revision I found it necessary to prepare figures of the ♂ wings, it became apparent that the neuration of the ♂ is abnormal, and that the genus must be considered as exceptional as is the case with *Thamastes*, *Anomalopteryx* and *Enoicyla*.

The characters given below are based on those selected by Ulmer and refer to the ♀ sex alone, with the exception of the spurs which are 1, 3, 3 in both sexes.

Head very short and broad with a pair of transverse warts towards the back and a pair of small rounded warts between these and the lateral ocelli; antennae generally thin, as long as

the anterior wing, the basal joint thicker and longer than the following ones and longer than the head; maxillary palpi very long and fine, first joint short, second equal to the fourth, the third somewhat longer, as long or even longer than the fifth; legs thin and long, with the spurs 1, 3, 3 inner spur slightly longer than the outer, spines black; first joint of the fore-tarsus as long as the second and third joints together. Anterior wing thickly clothed with hair and with the apex dilated, the apical border undulating so that the margin is concave in the fourth, fifth and sixth apical cells, the fringe at these points being comparatively long; neuration of the ♀ regular, forks Nos. 1, 2, 3 and 5 present; radius bent slightly before its extremity; discoidal cell very long and narrow, about three times as long as its foot-stalk, its upper and lower margins nearly straight; fourth apical cell closed by a straight nervure which is slightly longer than that of the second. Posterior wing only slightly broader than the forewing, discoidal cell much shorter than that of the forewing; only 8 apical veins present instead of the usual nine, the sixth apical vein being missing so that only forks Nos. 1, 2 and 5 are present; fourth apical cell as in the anterior wings.

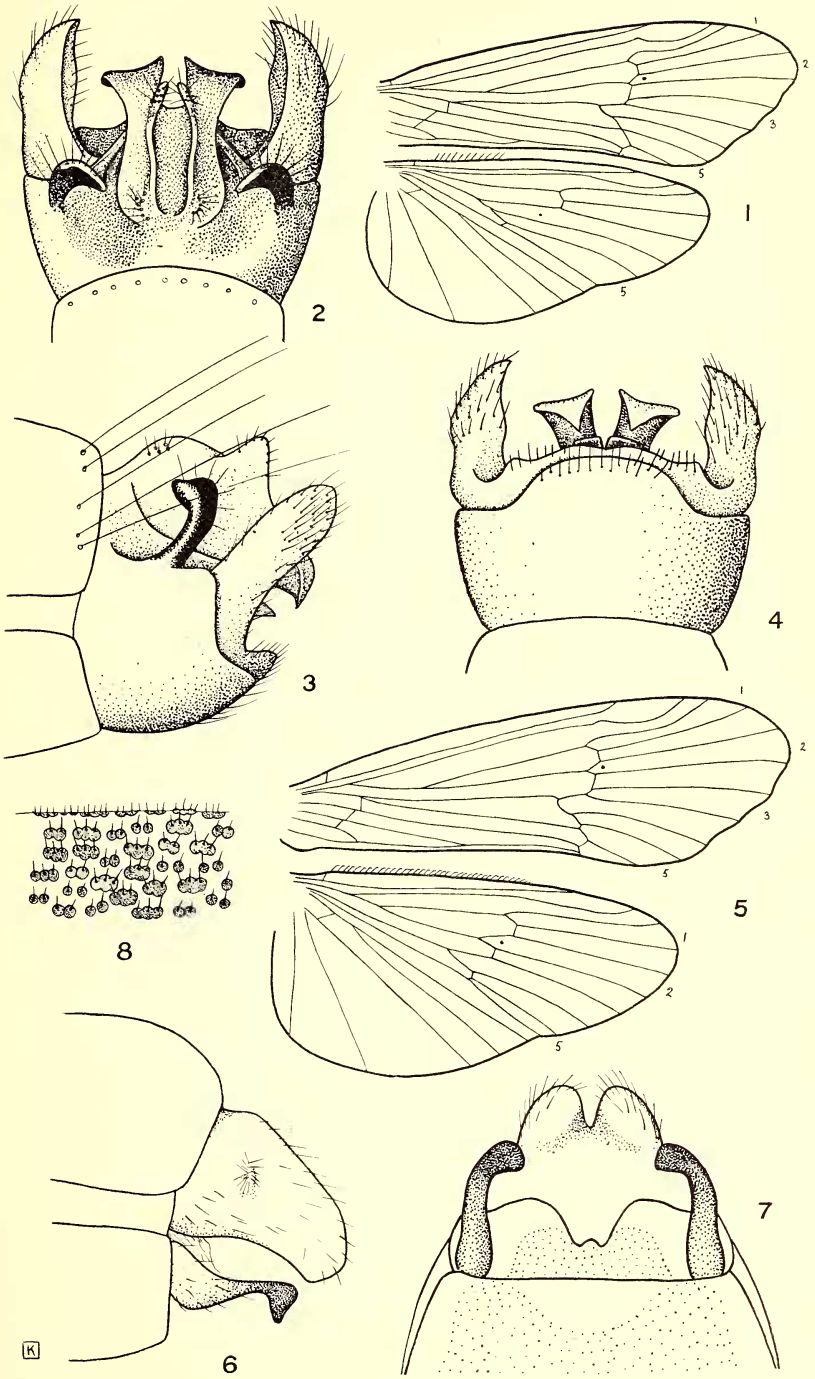
It may be added, with reference to the male, that in the posterior wing the discoidal cell is wanting, only fork No. 5 is present and that the first joint of the maxillary palpus is very minute. It cannot be made out at all in the type of *albipunctatus* in the British Museum, but Mr. Martynov (*in litt*) states that 'in the ♂ of *H. ussuriensis* there are three joints of which the basal is very short although distinct'.

Halesinus albipunctatus Mart. (Text-figs. 9-10; Pl. XII, figs. 1-8).

Halesinus albipunctatus Martynov.—Proc. Zool. Soc. Lond., Pt. I, No. 7, pp. 98-100, figs. 52-6, 1930.

Head black with slender black antennae; mesonotum black with the median impressed portion reddish-brown; metanotum dark brown. Maxillary palpi ♂ basal joint very short, second and third joints long and thin, approximately equal in length. Legs yellowish-brown; tarsi somewhat blackish externally. Anterior wing dilated towards the apex the margin of which is obliquely truncate, and distinctly undulating so that it is concave in the fourth, fifth and sixth apical cellules; membrane brown, clothed with blackish hairs; there are several pale yellow rounded spots particularly in the costal and sub-costal areas and two oblique pale spots between the cubitus and the hind margin and also two round yellowish spots at the arculus; fringe long with whitish spots here and there; discoidal cell long; posterior wing ♀ smoky, with a long discoidal cell; neuration of the male posterior wings abnormal as may be seen in the figure; there is a well-developed frenulum in both sexes, an unusual feature in the *Limnophilidae*.

Genitalia ♂.—Margin of the eighth dorsal segment fringed with long stout hairs; from above, beyond it is a large bifurcate dorsal plate with a narrowish cleft between the two forks, the sides of the cleft standing up in two sharp ridges of which the



Halesinus albipunctatus Mart., Fig. 1, wings ♂. Fig. 2, genitalia ♂, dorsal. Fig. 3, lateral. Fig. 4, ventral. Fig. 5, wings ♀. Fig. 6, genitalia ♀, lateral. Fig. 7, ventral. Fig. 8, portion of penultimate ventral segment ♀, enlarged.

distal ends are abruptly elevated in a pair of triangular processes; beyond the cleft, the plate slopes sharply downward and each fork terminates in a broadened truncate apex, apical angles projecting beyond the sides of the fork; on each side of the dorsal plate there is a large, strongly chitinised blackened curved hook, as seen from the side, directed upward with the apex slightly forward; penis retracted and difficult to make out; lower penis-cover broad, with excised apex which, seen from beneath appears as a pair of broad, shallow, truncated lobes; inferior appendages single-jointed; from the side, rather broad and straight, directed upward; from above, outer margins convex, inner straight or slightly sinuous, apices acute; from beneath, they are widely separated but connected at their bases by a strongly chitinised plate with a sinuous apical margin; margin of the ninth ventral segment strongly produced and rounded at its centre.

Genitalia ♀.—From above, the ninth dorsal segment terminates in two triangular processes separated from each other by a narrow cleft, each with a rounded wart at its base; from the side, they are very broad at the base, upper margins convex, lower sinuous, apices directed downwards; the margins of these processes and also the warts are rather densely fringed with long hairs; on each side of the central triangular processes are rather short, strongly chitinised caliper-like branches which, from beneath, terminate in clavate apices; from the side, each of these branches has the appearance of a duck's head, neck and shoulders directed downward; there is a ventral plate with a deeply cleft apical margin and a small central lobe, no doubt representing the vulvar scale; along the margin of the penultimate ventral segment there is a deep band of minute black setae arranged in groups of twos and threes to make a close pattern.

Length of anterior wing ♂ 11 mm.
Length of anterior wing ♀ 12 mm.
Tibet; Yatung, A. E. Hobson.
Type ♂ and 3 paratypes ♀♀ in the British Museum.

Platyphylax McLach.

Platyphylax McLach.—Journ. Linn. Soc. Zool., xi, p. 109, 1871; Rev. and Syn. Trich., p. 143, 1875; Ulmer.—Gen. Insect., fasc. 60a, pp. 53-4, 1907.

Spurs 1, 2, 2, ♂ ♀. First joint of the anterior tarsi long in both sexes. Palpi and legs slender (typically). Form of wings and general appearance much as in *Stenophylax* or *Halesus* (typically); anterior wings shining with scarcely any pubescence on the membrane (typically). Male with long up-directed inferior and broadly rounded superior appendages. The apex of the abdomen very obtuse, without appendages.

The above is McLachlan's description of the generic characters but he adds 'The Chinese *P. lanuginosus* and numerous North American species are widely divergent and in a general work on the species of the world it would be necessary to place them in several genera'.

Martynov's *rufescens*, a ♀, and the only described Indian species, hardly conforms to the generic characters, but until the Indian species of this genus are better known, particularly the males, it would be premature to extend the characters to cover this one case.

Genotype: *Platyphylax frauenfeldi* Brauer.

Platyphylax rufescens Martynov (Pl. XIII, figs. 1-5).

Platyphylax rufescens Martynov.—Proc. Zool. Soc. Lond., Pt. I, No. 7, pp. 105-6, figs. 64-6, 1930.

The type of this species is a ♀ of which Martynov's description is as follows:—

'Head and thorax yellowish-rufous with concolorous hairs. Antennae and palpi also yellowish-rufous. Legs yellow with few black spines; spurs yellowish-rufous 1, 2, 2. Anterior wings with parabolic apical margin, membrane finely granulose clothed with short yellowish hairs; fringe concolorous, yellowish without markings; post-costal area slightly brownish, irrorated with indistinct hyaline spots. Discoidal cell long, somewhat dilated at the end; first and third forks triangular, not deeply impinging inwards. Nervures pale testaceous. Posterior wings yellowish, sub-hyaline. Neuration resembling that in the anterior wings; fourth apical cell closed basally by an oblique nervure as in the anterior wings. Discoidal cell very long. Abdomen pale reddish-yellow, seventh, eighth and ninth segments brownish. Eighth segment normal, large; eighth sternite with a deep excision, side borders of which are sinuous; behind the sternite is small oval lobe and in the distal portion of the excision two minute lobules. Ninth segment small, reduced, more or less fused above with the tenth segment and with the superior appendages, but lateral portions better developed, subquadrate beneath, hairy; dorsal portion of the ninth segment with a median excision as far as the base. *Appendices superiores* fused with the tenth segment but their edges discernible above; from above they are broad at the base with oblique outer margins; hind margins excised and each sub-divided into two small lobes. Tenth segment (fused with the superior appendages) forming two long stick-shaped processes above and a transverse short plate beneath.

Length of body 10 mm. Expanse 27 mm.

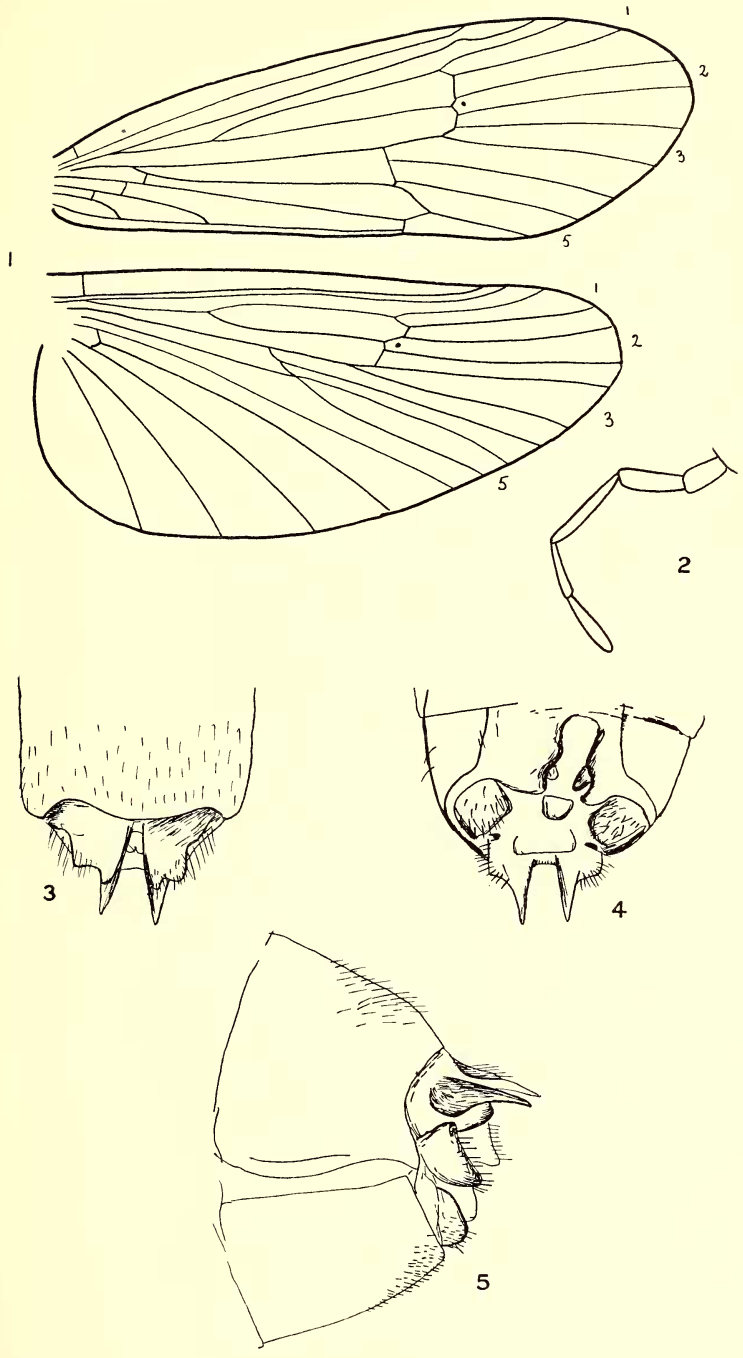
Tibet; Yatung, 4,500 ft., A. E. Hobson.

Type ♀ and paratype ♀ in the British Museum.'

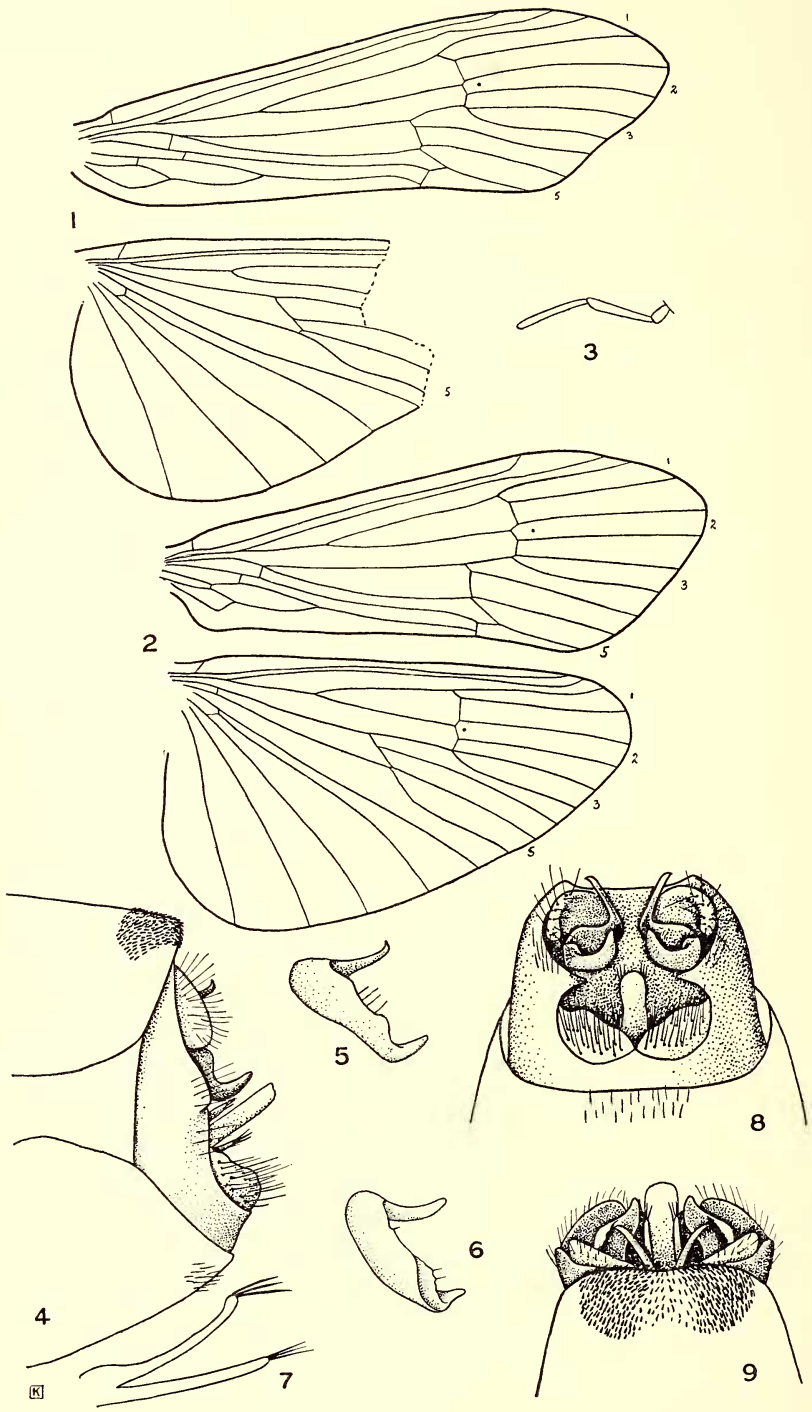
Phylostenax Mosely.

Phylostenax Mosely.—Entom., lxviii, p. 184, 1935.

Insects large and brown, somewhat resembling *Pseudostenophylax* species but without the specialised scales of the posterior wing; anterior wing somewhat elongate, costal margin straight, apex only slightly dilated; in both wings second apical cellules very broad and forks No. 3 very acute at their bases; anterior wing, discoidal cell rather long and narrow, that of the posterior wing very broad at its distal end; shape somewhat different in



Platyphylax rufescens Mart., ♀. Fig. 1, wings. Fig. 2, maxillary palpus. Fig. 3, genitalia, dorsal. Fig. 4, ventral. Fig. 5, lateral (genitalia after Martynov).



Phylostenax himalus sp.n., ♂. Fig. 1, wings of type (Muktesar). Fig. 2, wings of a second specimen (Darjiling). Fig. 3, maxillary palpus. Fig. 4, genitalia, lateral. Fig. 5, intermediate appendage (Muktesar). Fig. 6, ditto (Darjiling). Fig. 7, a penis sheath, lateral (Darjiling). Fig. 8, genitalia, from beneath and behind. Fig. 9, genitalia, dorsal.

the example from Muktesar, but the wings in this insect are incomplete; membrane of the anterior wings scarcely granulose, brownish with numerous pale round irrorations; pubescence somewhat scanty but there is a mat of black hairs in each basal anal angle of the anterior wings.

Maxillary palpus male, first joint small, second and third long and approximately equal in length. Legs, terminal tarsal joints scantily furnished with black spines; genitalia, given in detail in the description of the genotype.

In the Muktesar insect the spurs are 1, 2, 2, but in the examples from Darjiling the legs are so broken that the spurs are uncertain. Three legs are gummed to the label, one showing three spurs, but these may perhaps have been detached from some other insect.

Genotype: *P. himalus* Mosely.

If the spurs alone were considered, *himalus* might perhaps be placed in *Platyphylax*, but McLachlan considered that the European species *P. frauenfeldi* was typical of the genus and that the ultra-European species would be better placed in other genera.

As I am also of opinion that the collection of many widely divergent forms of neuration and genitalia in one genus tends to confuse rather than simplify classification, I prefer to create a new genus rather than overload an existing one.

Phylostenax himalus Mosely (Pl. XIV, figs. 1-9).

Phylostenax himalus Mosely.—Entom., lxviii, p. 184, 1935.

General characters detailed in the generic description.

Genitalia ♂.—Margin of the eighth dorsal segment covered with small black setae which tend to group in two rounded masses towards the sides of the segment; superior appendages small and very wide, scarcely showing beyond the margin of the segment, from the side pear-shaped; the intermediate appendages are branched and the upper branches project beyond the margin of the segment, appearing as two divergent, rod-like processes; the lower branches are heavily chitinised and from above are rather widely separated, broad, inclining towards each other, apices wide and truncate, turned slightly upward with a strong ridge connecting the two apical angles; from beneath and slightly behind, they are strongly curved and direct upward; penis short and straight, furnished with a pair of forked sheaths whose apices are fringed with stiff bristles, the upper branch of each fork appearing above the penis and the lower, below; inferior appendages very small and wide, welded to the segment, on the eighth sternite, towards the centre is a tuft of fine spines.

Length of anterior wing ♂ 15 mm.

United Provinces; Kumaon, Muktesar, 7,000 ft., 24-iv-1923 to 15-v-1923, Fletcher coll.; Darjiling.

Type ♂ (Muktesar) in the collection of the British Museum. Paratypes, 2 ♂♂ Darjiling, in the collection of the Indian Museum, Calcutta.

The example from Muktesar differs slightly from the two examples from Darjiling both in the form of various parts of the

genitalia and also in the neuration, particularly in the form of the base of the discoidal cell in the posterior wing, wings much broken in the Muktesar insect. These differences, however, do not in my opinion, warrant the separation of a second species. The spurs of the legs of the Darjiling examples are doubtful as the legs have been broken off and reattached, possibly mistakenly.

Anabolia Stephens.

Anabolia Stephens.—Ill. Brit. Ins., p. 229, *partim* 1837; McLach.—Rev. and Syn. Trich., p. 101, 1875; Ulmer.—Gen. Insect., fasc. 60a, p. 45, 1907.

Spurs 1, 3, 4, ♂ ♀. Anterior tarsi with the first joint long in both sexes. Antennae about the length of the wings, moderately stout. Anterior wings elongate, nearly unicolorous, fuscous, gradually, but not widely, dilated to the apex which is parabolic; discoidal cell and most of the apical cellules long; external basal cellule and ninth apical cellule short, the latter not extending to the anal angle; membrane scarcely granulose; no pterostigma. In the posterior wings, the fourth apical cellule at its base is as broad as the second, and is closed by an oblique nervule. Superior appendages of the ♂ very large; intermediate forming two long laterally-lanceolate blades; inferior short and cylindrical. Penis-sheaths furcate at the apex; penis slender, simple. No ventral teeth in either sex. In the ♀, the abdomen is very obtuse; ninth dorsal segment small; no appendages, but the tubular piece above forms broad sub-quadrate lobes.

I have given above McLachlan's description of the genus. The single Indian known species, *oculata*, has been described by Martynov and placed in *Anabolia*. I am unacquainted with the species and cannot say to what extent the neuration conforms with the above characters as the wings are not figured.

Anabolia oculata Martynov. (Text-figs. 11-13).

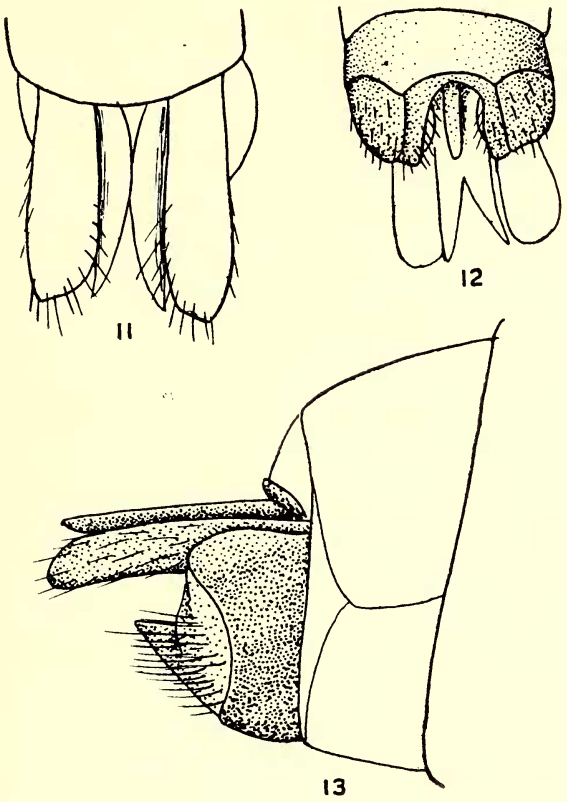
Anabolia oculata Mart.—Ann. Mus. Zool. Acad. Sci. St. Petersb., xiv, pp. 259-60, Pl. V, figs. 1-3, 1909.

Head, thorax and abdomen blackish fuscous; antennae black; maxillary palpi fuscous; coxae and femora black, anterior and median tibiae fuscous, tarsal joints testaceous, at the apex brownish; tibiae of the posterior pair proximally testaceous, distally fuscous; spines black. Anterior wings fuscous with some hyaline markings:

(*a*) a hyaline transverse spot at the base of second, third, fourth and fifth apical cells;
(*b*) a large irregular spot at the end of the thyridial cell and in the sub-discoidal area;
(*c*) a small transverse narrow spot before the pterostigma;
(*d*) a small spot at the end of the sixth apical cell;
(*e*) along the veins and on costal and post-costal areas there are small pale dots.

Neuration black; posterior wings sub-hyaline; the fourth apical cell at the base as broad as the second; cubitus furcate at the quarter beyond the level of the discoidal cell.

Genitalia ♂.—Superior appendages blackish; from the side, superior margin convex, inferior slightly concave; the apex slightly



Figs. 11–13. *Anabolia oculata* Mart., ♂. Fig. 11, genitalia dorsal. Fig. 12, ventral. Fig. 13, lateral (after Martynov).

bent downwards; they are narrow, entire (not divided at the end); intermediate appendages (tenth segment) black, divergent and as long as in European species; side-pieces of the ninth ventral segment large, posterior margin impressed and covered with black hairs; inferior appendages forming a narrow margin along the edge of the ninth ventral segment (beneath), with ends produced somewhat triangularly (if seen from the side), all these anal parts blackish; penis not exserted.

Length of body 13 mm.; expanse 35 mm.

♂.—Tibet Orient; -vii-1901, Kozlov.

Stenophyliella gen. n.

Maxillary palpi ♂, first joint rather more than half the length of the second which is slightly shorter than the third. Antennae

longer than the anterior wing, basal joint large, the second very short, about half the length of the following ones. Wings large, anterior brownish with faint yellowish annulations, membrane not granulose and covered with fine recumbent black hairs, apices considerably dilated. Posterior wings very broad; sub-hyaline, no scales in the anal region. Legs with spurs 1, 3, 4 and black spines but there are no spines on the terminal tarsal joint. Genitalia showing an affinity with those of the species of *Pseudostenophylax*.

Stenophyliella closely resembles the European genus *Stenophylax* and it is scarcely possible to find any substantial difference in neuration or the armature of the legs to separate them. But I am unwilling to place the single Indian known species in *Stenophylax* as this genus is already overloaded with incongruous forms and a far closer affinity is shown with Martynov's genus *Pseudostenophylax* although the scales on the posterior wings, which are a prominent feature of this genus is wanting.

Details of the genitalia appear in the specific description.

Genotype: *Stenophyliella kashmirensis* sp. n.

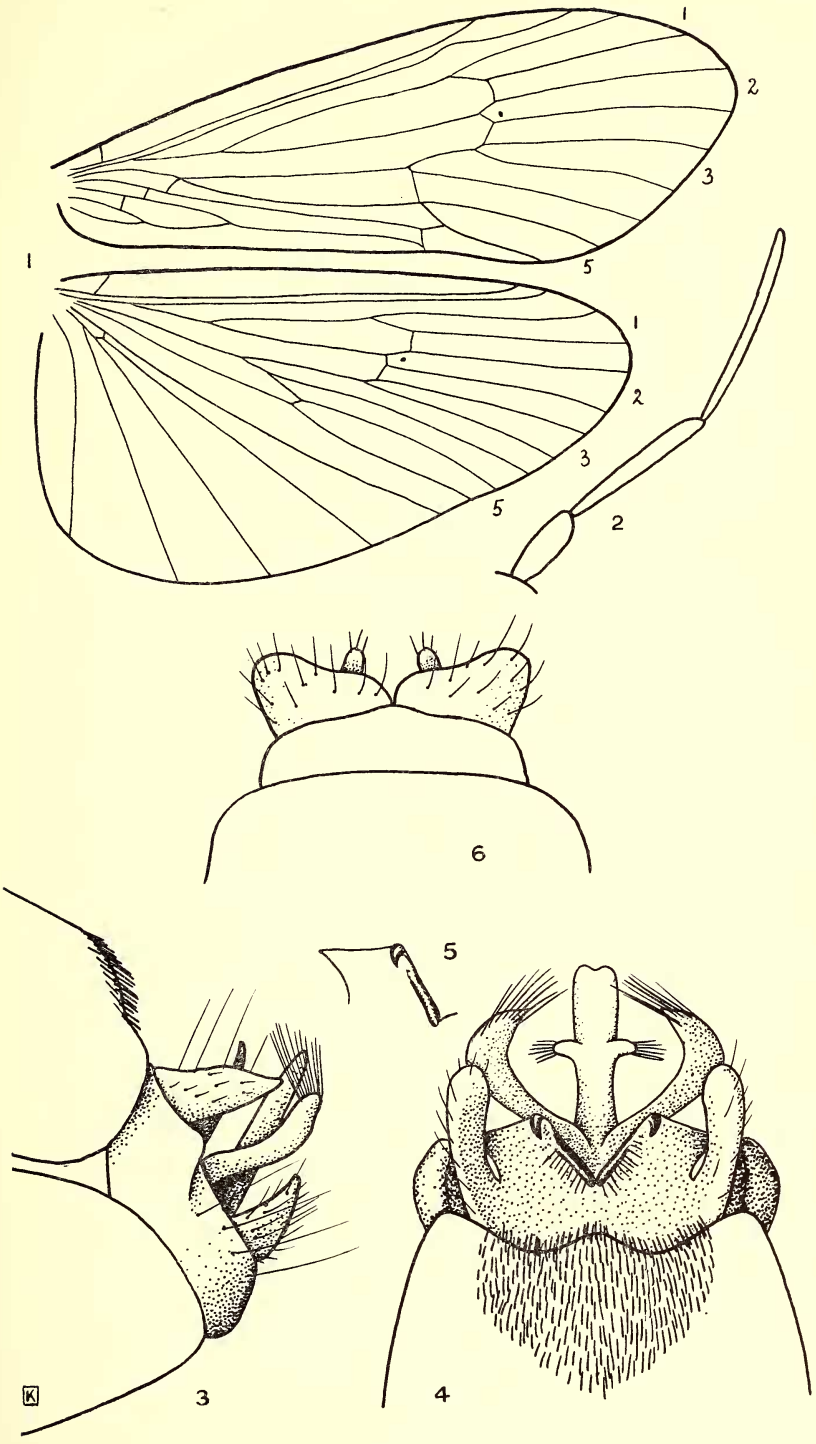
Stenophyliella kashmirensis sp. n. (Pl. XV, figs. 1-6).

The two examples of this species were collected in fluid by the late F. J. Mitchell and subsequently mounted in balsam. They are large insects, anterior wings brownish with faint yellow irrorations, apices considerably dilated, membrane set with short black setae between longer recumbent black hairs but scarcely granulose. Legs with spurs 1, 3, 4; no spines on the terminal tarsal joint.

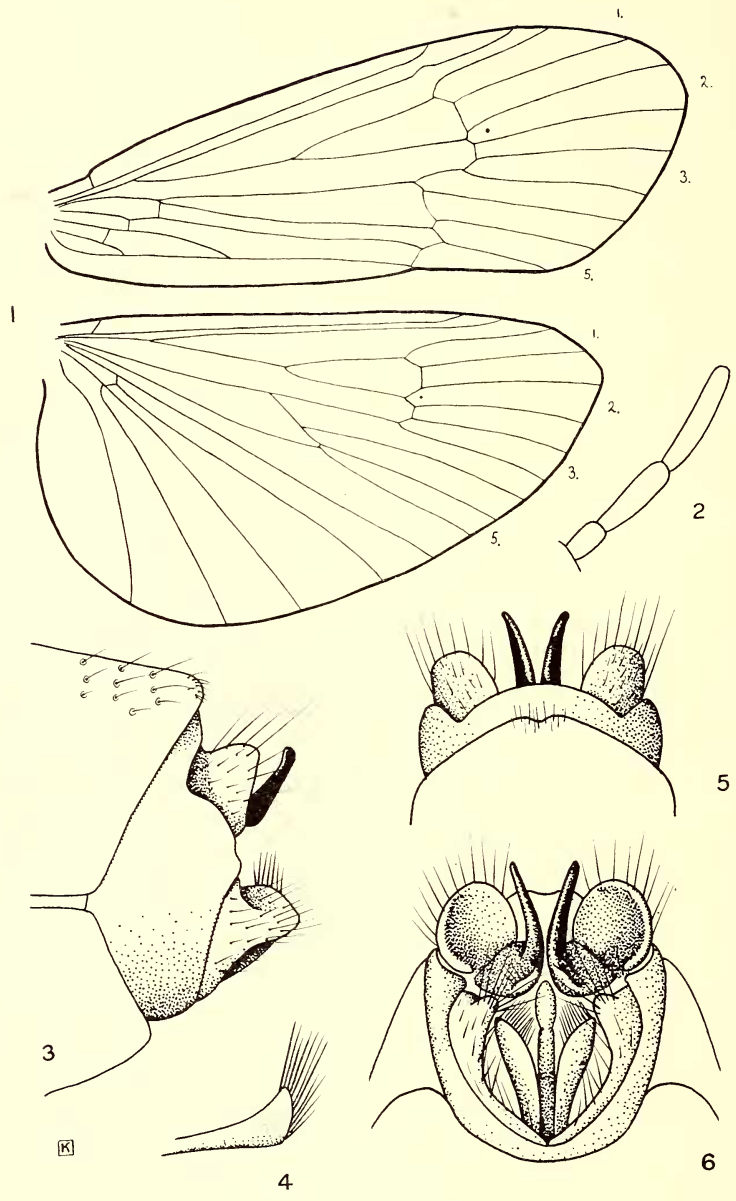
Genitalia ♂.—Margin of the eighth dorsal segment from above, slightly produced at its centre and covered with fine black setae; superior appendages from above and slightly behind, rather large, dilated at their apices; from the side, broad at the base tapering from about midway to acute apices; intermediate appendages from above and slightly behind, broad, apices truncate, with the inner angles turned upwards in acute blackened processes, the outer angles produced in broad triangular plates; the appendages are divided from each other by a wide triangular excision of which the margins are rolled over towards the base; from the side, the appendage appears as an upwardly directed blackened spur; penis straight, bearing two lateral processes about midway, one on each side making a cross, each furnished at its apex with long hairs, apex of the penis slightly excised; penis-sheaths appear as strong curving arms at the sides of the penis, caliper-shaped, apices curving inwards and furnished with bunches of bristles which meet inward across the penis, from the side they curve slightly upward; inferior appendages from the side narrow and pointed broader at the base; from beneath very broad, apices truncate or sinuous, each with a small blunt process towards its inner angle; ventrally the appendages nearly touch at their inner margins and are divided from each other by a narrow V-shaped excision.

Length of anterior wing ♂ 18 mm.

Kashmir, F. J. Mitchell.



Stenophyliella kashmirensis sp.n., ♂. Fig. 1, wings. Fig. 2, maxillary palpus. Fig. 3, genitalia, lateral. Fig. 4, dorsal. Fig. 5, intermediate appendage, dorsal. Fig. 6, inferior appendages, etc., ventral.



Astenophylina kashmirus sp.n., ♂. Fig. 1, wings. Fig. 2, maxillary palpus Fig. 3, genitalia, lateral. Fig. 4, penis sheath, lateral. Fig. 5, genitalia, dorsal. Fig. 6, from behind.

Type ♂ and paratype ♂ in the author's collection, both mounted in balsam.

Astenophylina gen. n.

Insects large and brownish, wings rather short and rounded, sub-costa joined to the radius by a cross vein; first apical sector in each wing curved at its base; second apical cellule very broad at its base; discoidal cell short and broad in each wing; surface of the wings not granulose or set with short stiff hairs. Maxillary palpi very short, no longer than the labial palpi, but possibly abnormal in the unique type; basal joint very short, second joint slightly shorter than the third. Legs, spurs 1, 3, 4; terminal tarsal joints furnished with black spines. Genitalia conforming with the *Pseudostenophylax* group in respect to the fringed penis-sheaths and small inferior appendages, but without the black setae bordering the margin of the eighth segment.

Astenophylina kashmirus sp. n. (Pl. XVI, figs. 1-6).

The unique type was collected in fluid and subsequently dried out and set; beyond that it is a brownish insect, it would hardly be safe to give a description of its general appearance; characters other than genitalia are noted in the generic description.

Genitalia ♂.—Margin of the eighth dorsal segment without any mat of black setae; in the unique type, the ninth segment is rather extruded, its dorsal margin rounded; superior appendages short and rounded, ear-shaped, fringed with long fine hairs, triangular from the side with a wide base; between them, from above, are the intermediate appendages which are narrow, strongly chitinised with approximate bases and widely divergent apices, from the side, directed upward; penis, from beneath, slender, with an ovate apex and two stout sheaths each broadened at its apex and with a produced upper angle as seen from the side; inferior appendages short and triangular, welded to the ninth segment, fringed with long black hairs; ninth ventral segment deeply excised with a large rounded excision.

Length of anterior wing 15 mm.

India; Kashmir, R. Arrah, F. J. Mitchell.

Type ♂ presented by the author to the British Museum.

Stenophylax (Allophylax) indicus Navás.

Stenophylax (*Allophylax*) *indicus* Navás.—Mem. Ac. Pont. Rome, (2) Nuov. Linc., iii, pp. 9-10, 1917.

I am unacquainted with this Darjiling species and therefore give the description as written by the author. No figures are given.

'Caput, palpi, antennae testaceae, pilis testaceis; ocellus plumbeis; oculi fuscis.

Thorax fusco-ferrugineus, pilis fuscis.

Abdomen testaceo-ferrugineum, pilis testaceis brevibus, sparsis; ultimo tergito ♂ denticulis nigris toto vestito, margine postico truncato; cercis superioribus brevibus, intermediis adscendentibus

acutis; copulatore exerto cylindrico; lamina subgenitali seu ultimo sternito in processum longum filiformen cylindricum producto. Pedes testacei, pilosi, nigro setosi, calcaribus 1, 3, 4 longis, fulvis.

Ala anterior in tertio apicali lata apice rotundata; margine externo obliquo; membrana tota minute granulata, leviter fusco tincta, pone procubitum usque ad marginem posticum densius fuscata; tota maculis sive guttis parvis rotundatis pallidis conspersa, in tertis posteriore distinctioribus; stria pallida ad thyridium; pubescentia brevi, fusca; fimbriis brevibus, fulvis; reticulatione fulvo-testacea; cellula discali, longissima, saltem quater longiora suo petiolo; furca apicali prima parum intra cellulam discalem penetrante. Ala posterior basi lata, apice parabolice rotundata; membrana tota minutissime granulata vel potius impresso-punctata, hyalina, levissime fulvo tincta, distinctus in tertio apicale; pubescentia fimbriisque fulvis; reticulatione fulvo testacea; cellula discali longa, bis vel ter longiore suo petiolo, furca apicale prima parum cellulam discalem penetrante.

	♂	♀
Long. corp.	14 mm.	13 mm.
Long. ala post.	18.5 mm.	17 mm.
Long. ala post.	15.5 mm.	14.7 mm.

Patria Asia. Darjeeling in montibus Himalaya 1910 (Coll. m.). Si formam cellulae discalis attendas haec species ad genus *Allophylax* Banks referenda; sed genus hoc mea sententia omittendum, quod charactere parum conspicuo et definito nitatur- videlicet cellulae discalis et furcae apicalis primae longitudine quae summopere variat.'

The presence of the genus *Stenophylax* Kol. in India requires confirmation, so I defer giving a description of the genus for the time being.

Apataniinae Ulmer.

Apataniinae Ulmer.—Ab. Natur. Ver. Hamb., xviii, pp. 42, 74, 1903.

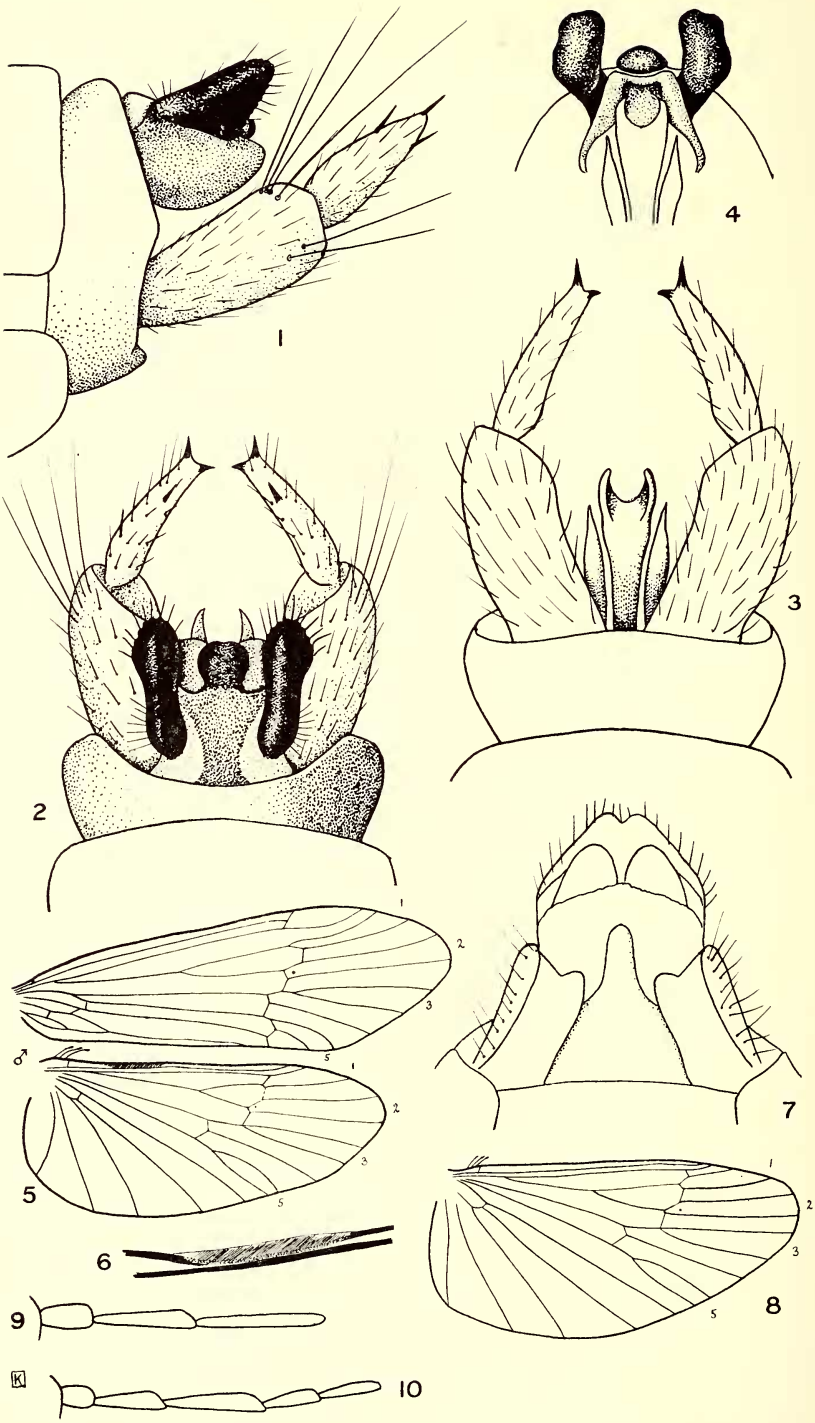
The *Apataniinae* are separated from the *Limnophilinae* by the abnormal neuration of the anterior wing in which the sub-costa ends in a cross vein joining the radius and costal margin instead of continuing directly to the margin.

[1]The Indian fauna so far known contains only the two genera *Apataniana* and *Apatidea* separated as follows:

Table of Genera.

1. Discoidal cell of the posterior wing present. Apataniana nov. gen. p. 475
—Discoidal cell of the posterior wing absent. Apatidea McLach. p. 476

[1] Since this part was sent to press, a large collection has been received from Assam and Burma containing at least one new genus in this sub-family. A description will appear later on in a supplement.



Apataniana hutchinsoni sp.n. Fig. 1, genitalia ♂, lateral. Fig. 2, dorsal. Fig. 3, ventral. Fig. 4, apices of superior appendages and penis, etc., ventral. Fig. 5, wings ♂. Fig. 6, costal margin of posterior wing ♂, enlarged. Fig. 7, genitalia ♀, ventral. Fig. 8, posterior wing ♀. Fig. 9, maxillary palpus ♂. Fig. 10, maxillary palpus ♀.

Apataniana gen. n.

The genus has been erected to take the new species *hutchinsoni* in which the characters of neuration differ considerably from all other genera in the *Apataniinae*.

Maxillary palpi ♂, first joint about half the length of the second which is slightly shorter than the third; ♀, first joint less than half the length of the second, third joint almost as long as the first and second together, fourth joint slightly shorter than the fifth which is about twice the length of the first. Antennae slender, about the same length as the anterior wing; basal joint large, second short, remaining joints each longer than the second. Wings; anterior alike in both sexes; sub-costa running into a cross vein joining the costa to the radius, forks Nos. 1, 2, 3 and 5 present, discoidal cell closed, moderately long and narrow; posterior wings broader than the anterior, sub-costa parallel with the radius, construction differing in the sexes; in the ♂ there is a narrow fold or flap along the costal margin towards the base of the wing lined with coarse yellow hairs; this fold is wanting in the ♀; discoidal cell closed, forks Nos. 1, 2, 3 and 5 present; in the ♂, radius running into the first apical sector, first apical fork short and rather broad at the base, second as long as the third which is sessile, fifth short and with a distinct foot-stalk. Spurs 1, 2, 4.

Genotype: *Apataniana hutchinsoni* sp. n.

Apataniana hutchinsoni sp. n. (Pl. XVII, figs. 1-10).

Head dark fuscous with light honey-coloured hairs; palpi dark fuscous; antennae dark ochraceous with narrow black annulations; prothorax, mesothorax and metathorax black; legs ochraceous, spurs black, 1, 2, 4.

Wings, anterior greyish with honey-coloured hairs; whitish patches along the apical border between the apical sectors, posterior wings greyish, ♂ with a fold, filled with yellow hairs in the costal margin towards the base.

Neuration as shown in Pl. XVII, figs. 5-6, 8.

Genitalia ♂.—Margin of the ninth dorsal segment very broadly and shallowly excised; there are two short black superior appendages, apices somewhat dilated and serrate. Between them is a dorsal plate narrow at the base, broadening in two wide lateral triangular shelves; the apex of the dorsal plate is produced in a rounded blackened process; beneath this plate is a strongly chitinised arched structure, sides very deep and slightly inturned beneath; penis from beneath, narrow at the base, broadening to a widely excised apex; there is a pair of penis-sheaths, one on each side, rather shorter than the penis, inferior appendages two-jointed, basal joint very stout, terminal more slender, slightly shorter, apex armed with two or three short acute spurs; there is also a single spur on each joint slightly before the apex.

Genitalia ♀.—Beyond the terminal dorsal segment is a small penthouse-shaped process with a slight excision at the apex; from beneath there are two chitinous plates towards the apex;

below this is the long central lobe of the vulvar scale, the outer lobes being formed by the produced lateral margin of the terminal segment.

Length of anterior wing ♂ and ♀ 10 mm.

Western Tibet; Kyam, 19-25-vii-1932, G. E. Hutchinson, Yale North India Expedition, 7 ♂♂, 1 ♀.

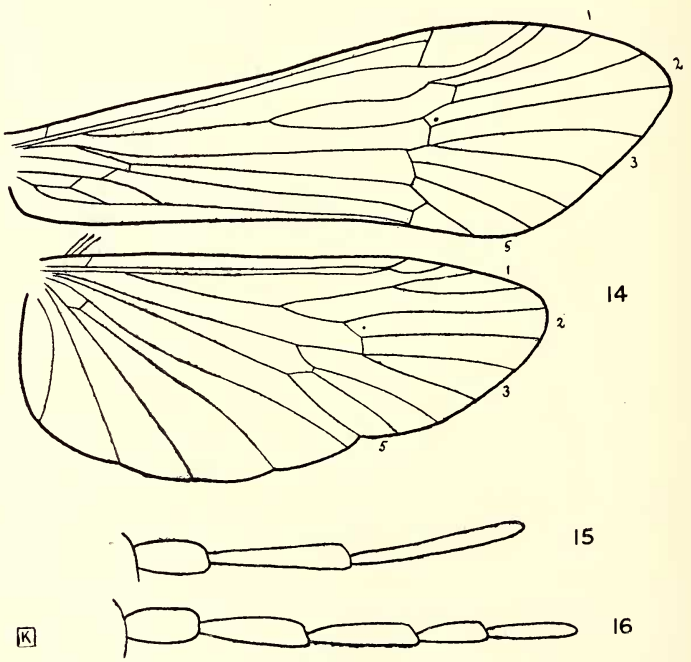
The collector, Dr. Hutchinson, to whom I have much pleasure in dedicating the species, states that the examples were all found under stones.

Type ♂ and paratypes ♂ and ♀ in the collection of the British Museum. Paratypes ♂ in the collection of the Yale University, U.S.A.

The genitalia of *hutchinsoni* closely resemble Martynov's figures of *Apatania bulbosa* which in the ♂ posterior wing also displays the narrow costal fold with the yellow hairs but in respect to other features of neuration, *bulbosa* is very abnormal.

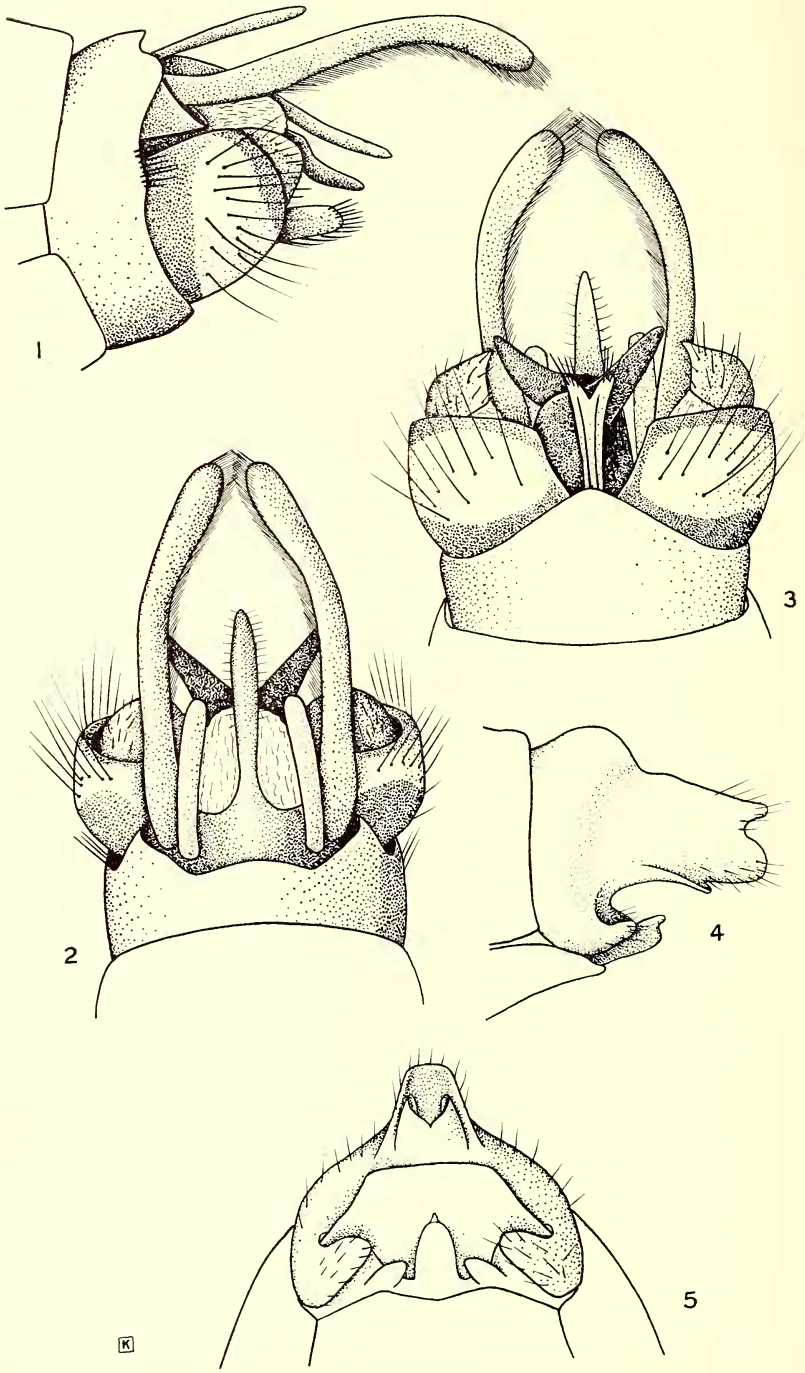
Apatidea McLachlan (Text-figs. 14-16).

Apatidea McLach.—Rev. and Syn. Trich., p. 217, 1876.



Figs. 14–16. ***Apatidea brevis*** **sp.n., Fig. 14, wings ♂. Fig. 15, maxillary palpus ♂. Fig. 16, maxillary palpus ♀.**

Apatelia Wallengren, subgenus of *Apatania*.—Ent. Tidsk. Arg., 7, H. 2, p. 78, 1886; Skand. Neur.—Kongl. Sv. Vet.—Akad.



Apatidea brevis sp.n. Fig. 1, genitalia ♂, lateral. Fig. 2, ♂, dorsal. Fig. 3, ♂, ventral. Fig. 4, genitalia ♀, lateral. Fig. 5, ventral.

Handl., Bd. 24, N. 010, p. 88, 1891; Martynov.—Ann. Mus. Zool. Ac. Sci., xxii, pp. 59, 63, 1918.

Maxillary palpi ♂, first joint about half the length of the second which is slightly shorter than the third; ♀, basal joint short, about two-thirds the length of the second, third equal to the second, fourth equal to the first and slightly shorter than the fifth. Antennae, basal joint large, the second very short, remaining joints each longer than the second. Anterior wing; the sub-costa ends abruptly in a transverse nervure joining the costa and radius; radius heavily fringed with short thick hairs; discoidal cell long and narrow, upper margin slightly excised, first apical cell very acute at its base, second, third and fourth truncate, fifth with a minute foot-stalk. Posterior wing; the radius is arched towards its distal end to touch or nearly touch the sub-costa; sometimes not suddenly arched but confluent at a point towards the distal end, sometimes joined by a minute cross vein: lower margin of the wing slightly scalloped.

Spurs 1, 2, 2 or 1, 2, 4 ♂ and ♀.

Genotype: *Apatidea copiosa* McLach.

A few words are required in explanation of the synonymy. The sub-genus *Apatelia* was erected by Wallengren in 1886 to take the species *inornata* Wallengr. and *fimbriata* Pict. in both of which the radius and sub-costa are partly confluent in the posterior wing. In 1918 Martynov raised the sub-genus to full generic status. At the same time, he revised McLachlan's genus *Apatidea* in which two species had been described, *elongata* McLach. and *copiosa* McLach. placing the former in *Apatania* and the latter in *Apatelia* with the consequent entire disappearance of McLachlan's genus. In *copiosa*, the neuration of the posterior wing is similar to that of *fimbriata*.

Martynov in this transgressed the laws of priority, McLachlan's *Apatidea* having been erected ten years prior to *Apatelia* Wallengr. As neither McLachlan nor Wallengren selected genotypes of their respective genera, I here fix *copiosa* McLach. as the genotype of *Apatidea* McLach. 1876 and *fimbriata* Pict. as the genotype of *Apatelia* Wallengr. 1886, the latter genus thus becoming a synonym.

Apatidea brevis sp. n. (Text-figs. 14-16, Pl. XVIII, figs. 1-5).

Head and oculi black, particularly the oculi; palpi fuscous; antennae fuscous, no noticeable annulations; prothorax, mesothorax and metathorax dark fuscous. Wings, anterior castaneous posterior rather paler, for neuration, see text-fig. 14. Legs fuscous, spurs 1, 2, 4; abdomen castaneous, paler beneath.

Genitalia ♂.—The margin of the ninth dorsal segment widely excised with the central portion of the excision slightly produced and rounded, sides curling slightly under to make sockets from which arise the intermediate appendages; beyond it is a median process, wide at the base and produced in a long, slender, tailwardly and downwardly directed finger; on each side of this process are the superior appendages which are considerably shorter than the median process; intermediate appendages very long and

strongly chitinised, heavily fringed, apices dilated and turned slightly downward; penis narrow, apex widely furcate, apex of each fork bearing two or three spines, beneath the penis are two long thin spines which are divergent so that they lie closely under the forks of the penis; penis-sheaths wide at their bases which cross, one over the other so that the narrower apices are widely divergent; inferior appendages two-jointed, basal joint short, very stout and round, terminal joint turned in and rather pointed.

Genitalia ♀.—From beneath, tubular piece narrow, central lobe of the vulvar scale broad and long, from the side, very deep, upper margin produced to make a small finger; side lobes very short and rounded; there is a broad, transparent sub-genital plate welded beneath to the tubular piece which, from the side is widely cleft.

Length of anterior wing ♂ 5.5-10 mm.; ♀ 8-10 mm.

Kashmir; Gagirbal, 5,190 ft., F. J. Mitchell, numerous ♂♂ and ♀♀; Killanmarg, 10,500 ft., 13-vii-1931, Fletcher Coll., 2 ♂♂, 19-22-vii-1923, Fletcher Coll., 1 ♂.

Type ♂ (Gagirbal) in the author's collection; paratypes ♂ and ♀, details as above, in the author's and the British Museum collections.

The species is very variable in size, the dimunitive ♂ with a 5.5 mm. wing being recorded from Kashmir, Killanmarg, 10.500 ft., the larger from Kashmir, Gagirbal, at 5,190 ft. *Brevis* bears a close resemblance to the Turkestan species *Apatidea copiosa* McL. but differs in the arrangement of spurs and in the length of the superior appendages which, in *copiosa*, are longer instead of shorter than the median process.

(To be continued).